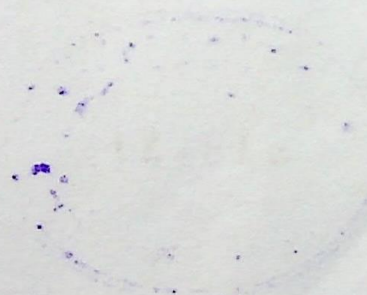
50
GOLDEN YEARS
IIP
turns a
Golden Leaf
Creating future fuels

Indian Institute of Petroleum Turns a Golden Leaf

A Commemorative Issue on Golden Jubilee of Indian Institute of Petroleum

Dehradun
Uttarakhand
India

A word of appreciation by H.E. Governor of Uttarakhand Mrs. Margaret Alva on her visit to IIP on Janurary 20, 2010

I have spent valuable time here and learnt about the work of the Institute over the past 50 years.

I congratulate the administrators and Scientists who have strived to make this Institute, a Centre of National pride.

I wish you success in all your plans for the future.

Margaret Alva
20/1/2010.

From the Director

Dr. M. O. Garg

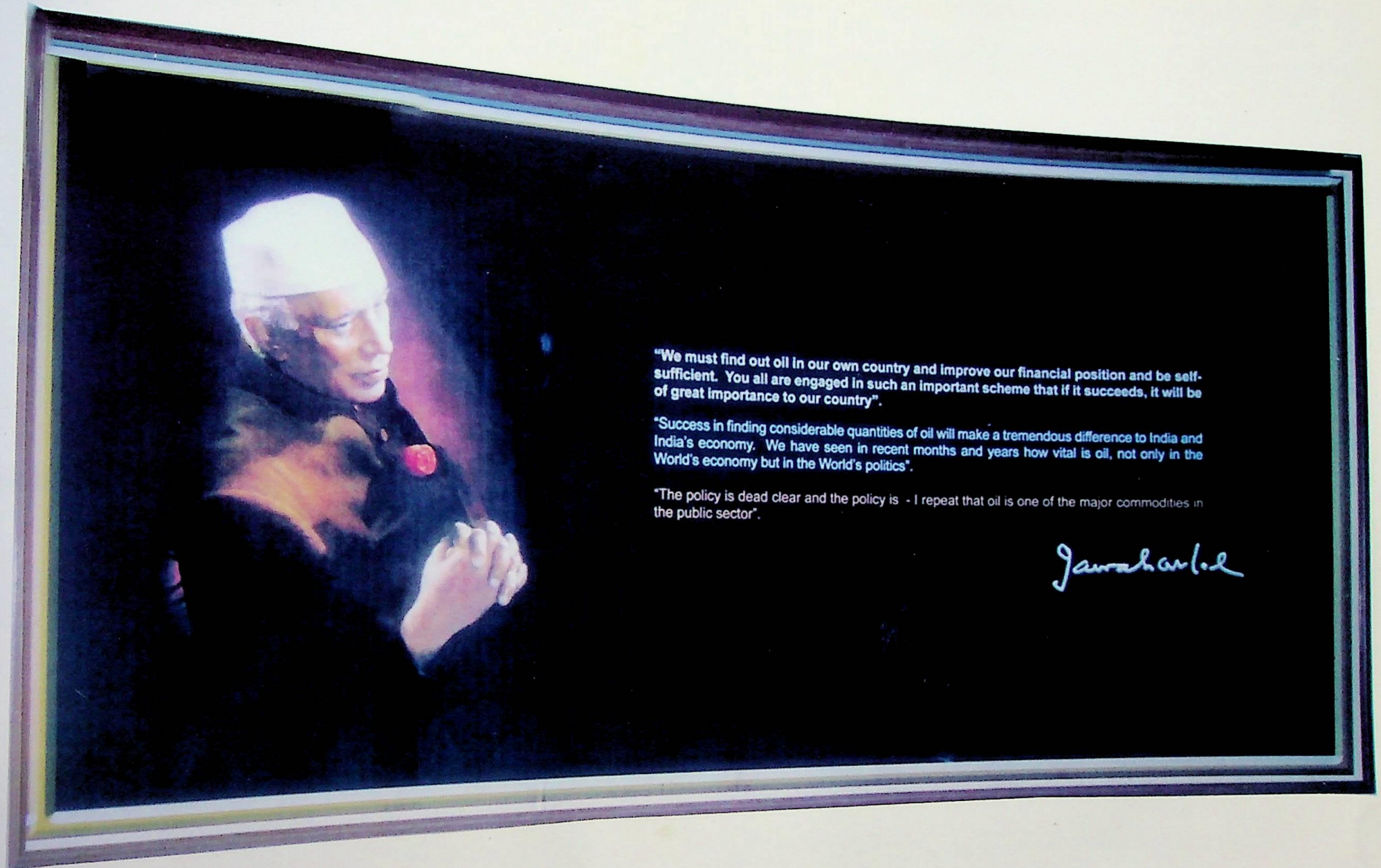
The journey of thousand miles starts from the first step; this golden step was taken on 14th April, 1960. Since then, several of our scientists and staff and previous directors have worked hard in laying a strong foundation, which has helped the institute not only to meet but also to exceed the expectations of the oil industry and the country.

The 50 golden years of the Indian Institute of Petroleum (IIP) is indeed full of several foot prints etched in the history of IIP. We have contributed in bringing up the oil industry from its infancy to a large giant what it is today; a string of 19 refineries processing 140 MT per annum crude oil. It is because of the strong foundation and untiring efforts by our scientists that I am proud to mention that IIP has at least a technology or a product or know-how or a service operating in each of these refineries. This would not have been possible without the strong support and confidence that we have enjoyed from our stake holders, clients, licensees and wellwishers. I would like to put on record my sincere thanks and appreciation to them.

Personally, I am extremely proud and feel privileged to head this great institution particularly, during the historic Golden Jubilee Year. Although, I came to IIP in July 1998 but I have been personally associated from my EIL days since March 1983 and I can say with great confidence that the institute will continue to grow and to provide solutions to meet the future energy needs of the nation.

We have tried to capture the 50 glorious years of IIP in this book and I am sure you will enjoy reading the great journey of this institute and its great and glorious past.

M.O. Garg
Director

"It should be determination on our part to search for oil and produce our own oil. There is no going back from this determination. If we succeed, we win the race; If we fail, we perish and suffer".
"We have gathered here in a spirit of dedication to a new cause. If we succeed, it is bound to revolutionise the entire concept of our economy".
"People have been asking me quite persistently, as to why I am so pessimistic in my statements. I said I have never been pessimistic but I am rather cautious, because oil is such a slippery thing even though you see it , it disappears at times".

"We must find out oil in our own country and improve our financial position and be self-sufficient. You all are engaged in such an important scheme that if it succeeds, it will be of great importance to our country".
"Success in finding considerable quantities of oil will make a tremendous difference to India and India's economy. We have seen in recent months and years how vital is oil, not only in the World's economy but in the World's politics".
"The policy is dead clear and the policy is - I repeat that oil is one of the major commodities in the public sector".
Jawaharlal

The early post independence era

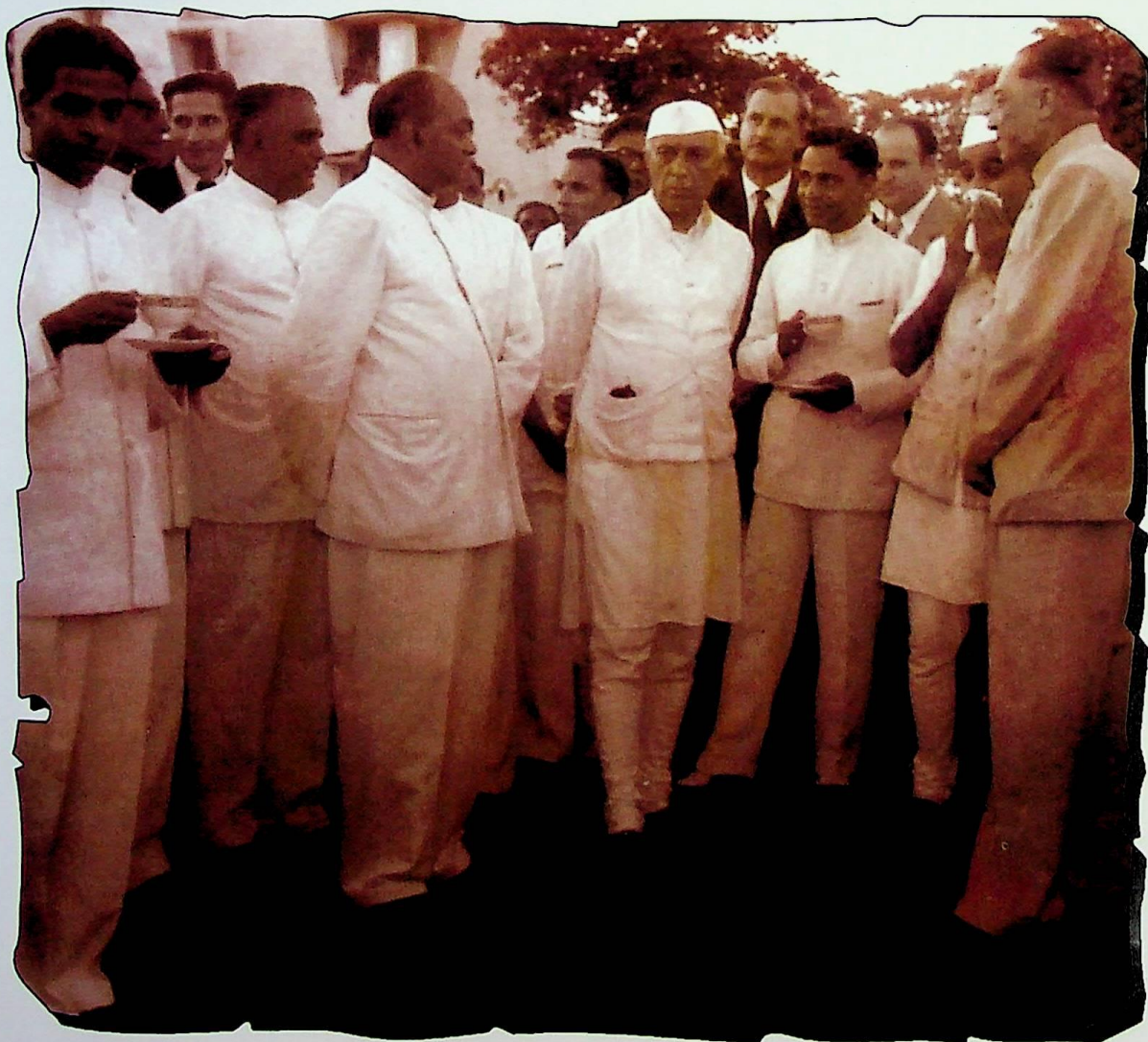
Pandit Jawahar Lal Nehru, the first Prime Minister of Independent India in discussion with Scientist in early 1950s

Post independence the major task that loomed large in front of the Indian leaders was to make the country stand on its feet especially on the agriculture, education, industry, science & technology and defence fronts.

While an all round development was planned by the new government of independent India, the realization by our great leaders about the growing need of producing and refining oil within the country for industrial development and to stem the drain of precious foreign exchange and undesired dependence on foreign countries was high on agenda. Indeed, it was supported by the vision of the first Prime Minister of independent India late Pandit Jawahar Lal Nehru for self reliance in oil. The Prime Minister had declared in the Parliament *"A country*

that does not produce its own oil is in a weak position from the point of defence. The absence of oil is a fatal weakness."

His vision was translated into reality by late Pandit Keshava Deva Malaviya, who was a dynamic minister of Natural Resources and Scientific Research in his cabinet, a man of perseverance, grit and determination.

In September 1955, a delegation headed by late Pandit Keshava Deva Malaviya visited the erstwhile USSR, Romania,

Pandit Jawahar Lal Nehru, the first Prime Minister of Independent India talking to the oil scientist

Pandit Keshava Deva Malaviya, the then Minister of Petroleum

The planners of the yester year with Pandit Jawahar Lal Nehru

"A country that does not produce its own oil is in a weak position from the point of defence. The absence of oil is a fatal weakness"

Pandit Jawahar Lal Nehru

Yugoslavia, Sweden, UK, France, West Germany and The Netherlands to study their oil industry and explore the possibility of securing technical expertise, required equipments, technology and other necessary help to embark on the search for oil and its refining in an organised and sustained manner.

He spoke to the nation over "Aakashwani" (All India Radio) on December 13, 1955, *"Prospecting and development of oil is a venture with no guarantee. Nevertheless, the risk is worth taking"*.

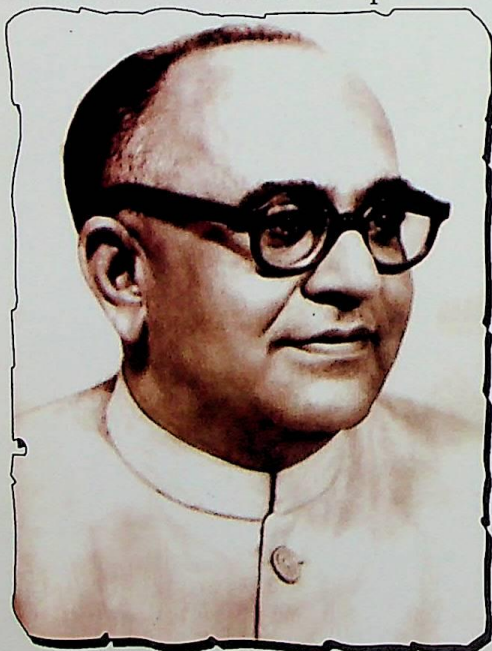
Pandit Keshava Deva Malaviya spoke to the nation over "Aakashwani" (All India Radio) on December 13, 1955, "Prospecting and development of oil is a venture with no guarantee. Nevertheless, the risk is worth taking."

In the real sense, India after awaking to the freedom realised that oil supplies to meet the bulk of her requirements from the Gulf of Sumatra, controlled by two or three countries could be withheld or made available only at an exorbitant price that would strangulate its already burdened economy. Later according to the Industrial Policy Resolution, of 1956 oil was made the State subject and a decision was taken to initiate action for searching oil indigenously. The foundation was laid for the national oil industry.

Pandit Keshava Deva Malaviya led the first oil delegation in 1955 from India to various countries including the erstwhile USSR

With this backdrop India ventured into the oil business in mid 1950's. This period saw the setting up of public sector undertaking companies in the field of exploration, exploitation, production and refining activities. PSU's like ONGC and Indian Refineries Limited (now Indian Oil Corporation Limited) came to being.

The Birth of IIP

The then fledgling hydrocarbon industry needed an institutional support that could not only forecast, plan and advice the Government on the future needs of the country but also do basic research and train the personnel needed for the downstream industry. The planners of the yester years had long debates and after thoughtful thinking with the authorities of Council of Scientific & Industrial Research (CSIR) and the then Ministry of Mines, Steel and Fuels on the setting up of a R&D Institute to assist India's indigenous oil activities specially related to the downstream.

Prof. M.S. Thacker

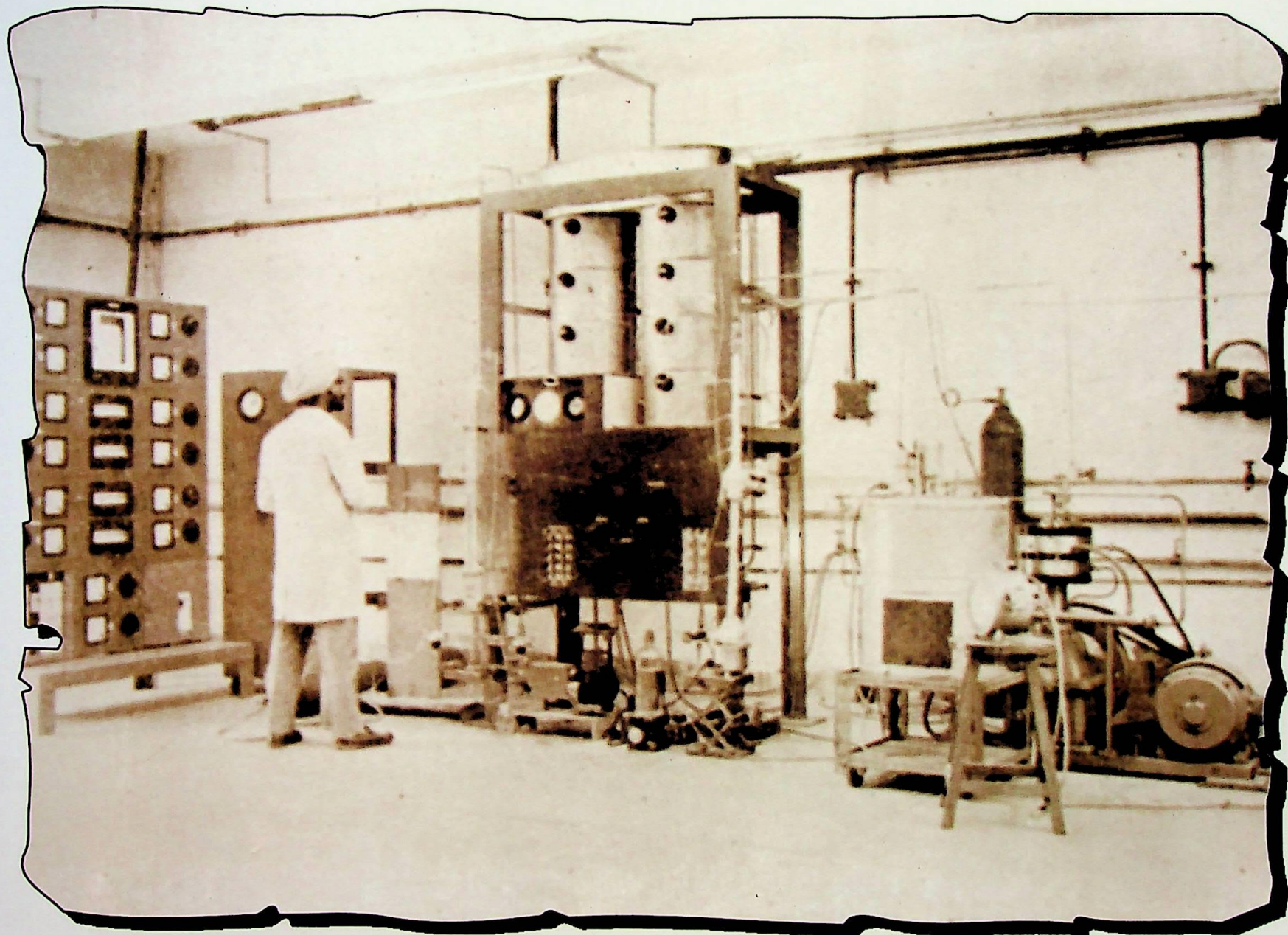
The Logo of CSIR

In India CSIR was the only Institute of scientific research that was set up pre-independence, in the year 1942, amid the raging World War-II by an eminent Indian scientist Dr. Shanti Swarup Bhatnagar. He was the first Director of CSIR.

The mission of CSIR is "To provide scientific and industrial R&D that maximises the economic, environmental and societal benefits for the people of India."

Although there was a research laboratory of CSIR for liquid fuels at the Central Fuel Research Institute at Dhanbad which took care of fuel based research, it was felt that a dedicated institute is the need of the hour for extensive research and study in the areas of refining, petrochemicals, product development & fuels and technology.

To explore this cause, the then Director General of CSIR Prof. M.S. Thacker was given the task to see the viability of such a dedicated institute in the field of petroleum by the government of India.

Prof. Thacker visited France and few other countries to seek collaboration in setting up of petroleum R&D Institute in India. It was during his visit to the world famous Institute Francais Du Petrole (IFP) in France that he liked their research model and considered it a good option for a petroleum research institute on similar lines at home in India. He later signed an agreement with IFP France on behalf of the Government of India to assist CSIR in setting up an institute

IIP started functioning in its initial days from CRRI Campus, New Delhi.

The then fledgling hydrocarbon industry needed an institutional support that could not only forecast, plan and advice the Government on the future needs of the country but also do basic research and train the personnel needed for the downstream industry. The planners of the yester years had long debates and after thoughtful thinking with the authorities of Council of Scientific & Industrial Research and the then Ministry of Mines, Steel and Fuels on the setting up of a R&D Institute to assist India's indigenous oil activities specially related to the downstream. It was thus that Indian Institute of Petroleum was conceived in the year 1959 and came to being in September 1960.

dedicated to the field of petroleum.

It was thus that Indian Institute of Petroleum was conceived in the year 1959 and came to being in September 1960. Indian Institute of Petroleum commenced its journey in the Central Road Research Institute (CRRI) campus at New Delhi from September 1960 before being shifted to Dehradun in the year 1963.

Indian Institute of Petroleum which is popularly referred as "IIP" is today one of the constituent laboratories under Council of Scientific and Industrial Research (CSIR), an apex research and development organisation of the country having 37 Research & Development Institutes related to practically all the branches of science and technology under its ambit.

IIP was placed under Ministry of Petroleum & Natural Gas for a brief period in its initial days before being brought back under the CSIR umbrella.

Today IIP is a crown in the jewel of CSIR.

The Visionaries

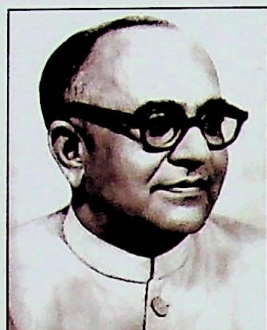
The story of Indian Institute of Petroleum will be incomplete without the mention of the visionaries behind its setting up and those who have been very ably steering it through the thick and thin of time over the years to its present level of glory and recogintion around the world.

In-fact the setting up of IIP at Dehradun was a result of the vision and far sightedness of late Pandit Jawahar Lal Nehru, the first Prime Minister of independent India, late Pandit Keshava Deva Malaviya, the father of Indian oil industry and the then Minister of Natural Resources and Scientific Research, Government of India who believed in self reliance by India in petroleum.

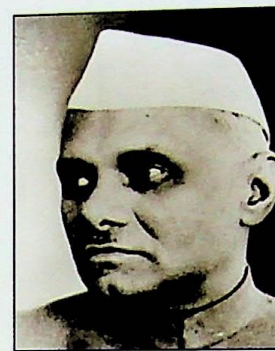
The great efforts of late Shri Mahavir Tyagi who was then a Member of Parliament and a very strong force from Dehradun and the Garhwal

The Efforts of Late Shri Mahavir Tyagi the then MP and a strong force from Dehradun and Garhwal region helped bring IIP from Delhi to Dehradun in 1963. The Picture above shows the tea garden where IIP presently stands. Inset Photo (Left) Oil drilling activities of ONGC. The reason for establishing IIP in Dehradun was because the ONGC headquarters were also here. Inset Photo (Right) The magestic Shivalik Ranges as seen from the IIP Campus.

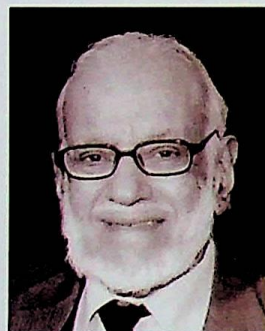
CSIR Director Generals: 1942 onwards

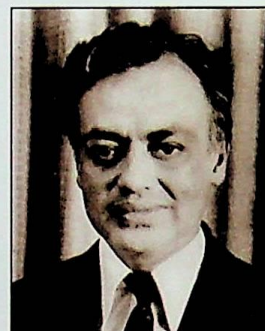
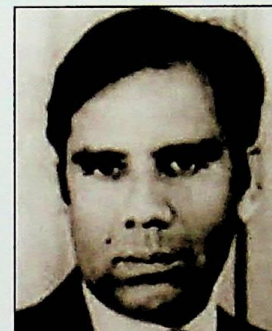
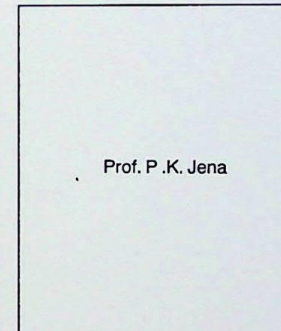
Dr. S.S. Bhatnagar
(Director)(1942 - 1954)

Prof. M.S. Thacker
(DG)(3.8.1955 - 1.8.1962)

Dr. S. Husain Zaheer
(DG)(1.9.1962 - 21.8.1966)

Prof. S.R. Mehra
(Officiated DG.)

Dr. Atma Ram
(DG) (22.8.1966 - 21.8.1971)

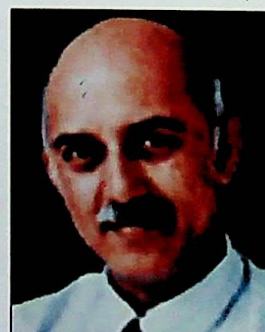
Dr. Y. Nayudamma
(DG) (27.8.1971 - 27.7.1977)

Dr. A. Ramachandran
(DG) (27.7.1977 - 9.10.1978)

Prof. M.G.K. Menon
(DG) (9.10.1978 - 4.5.1981)

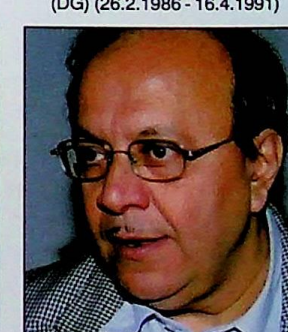
Dr. G.S. Sidhu
(DG) (5.5.1981 - 4.5.1984)

Dr. S. Vardarajan
(DG) (22.6.1984 - 27.1.1986)

Dr. G. Thyagarajan
(Officiated for 7 days in 1986)

Prof. P .K. Jena
(Officiated for 7 days in 1986)

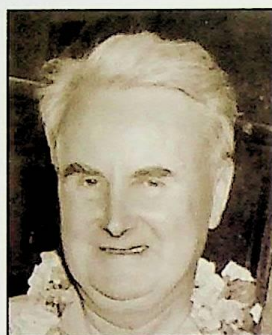
Dr. A.P. Mitra
(DG) (26.2.1986 - 16.4.1991)

Prof. S.K. Joshi
(DG) (18.4.1991 - 30.6.1995)

Dr. R.A. Mashelkar
(DG) (1.7.1995 - 31.12.2006)

Dr. V. Prakash
(DG Designate) (Dec-06)

Dr. M. K. Bhan, Secretary DBT
(Addl. Charge) (05.01.2007-06.03.2007)

Dr.T. Ramasami, (Additional Charge) (07.03.2007 - 11.11.2007)

Prof. Samir K. Brahmachari
(DG) (12.11.2007-To date)

Director IIP : 1960 onwards

Dr. J. W. Whitaker
November 1960 – March 1963

Dr. M. G. Krishna
(01.04.1963 to 03.06-1974)

Dr. I. B. Gulati
(04.06.1974 – 31.12.1985)

Dr. R. Krishna
(28.04.1986 – 30.091989)

Shri Sudhir Singhal (Acting Director)
(01.10.1988 – 19.09.1990)

Dr. T. S. R. Prasad Rao
(20.09.1990 – 31.01.1999)

Shri Sudhir Singhal
(12.05.2000 – 31.07.2003)

Dr. A. K. Gupta (Acting Director)
(01.08.2003 – 15.8.2003)

Dr. M. O. Garg
(15.08.2003 to date)

region also cannot be overlooked. It was his efforts that helped bring IIP from Delhi to Dehradun. He alongwith late Pandit Keshava Deva Malaviya dreamt of making Dehradun the oil capital of India as it was considered then that the Shiwalik ranges may have oil. With this intention they had also based ONGC head quarters here.

Besides these stalwarts, the CSIR is fortunate to have received the support and patronage of the top leaders of the country over the years. The Prime Ministers of India have always been CSIR's President while the Science and Technology Minister been its Vice President. IIP being a constituent laboratory of the CSIR feels it an honour to have the guidance of both the Prime Minister and the Minister of Science and Technology in addition to the Director General, CSIR.

The key role of all the Director Generals of CSIR from Prof. M.S. Thacker to the present Prof. Samir K. Brahmachari and all the Directors of IIP since 1960 onwards who have shaped this institute,

need a special mention. These people have been very instrumental in taking the institute from its very humble beginning to where it stands today in the league of major R&D institutes of the world.

Prof. Samir K. Brahmachari a molecular bio-physicist who is leading CSIR since November 2007 is a Ph.D. from the prestigious Indian Institute of Science, Bangalore. He is a scientist of international repute and a recipient of several coveted awards.

Prof. Brahmachari has made special contributions to the area of functional genomics with special emphasis on molecular genetics of neurological and psychiatric disorders and functional genomics *in silico*. These contributions helped the Institute of Genomics and Integrative Biology (IGIB), a CSIR Institute he headed prior to being the Director General CSIR, to secure a firm position on the world genome research map.

The Open Source Drug Discovery (OSDD) - one of his dream projects has culminated with global partnership into a programme to provide affordable healthcare to the developing world by providing a global platform where the best minds can collaborate & collectively endeavour to solve the complex problems associated with discovering novel therapies for neglected tropical diseases like Malaria, Tuberculosis, Leshmaniasis, etc.

Under the tutelage of the eminent scientists from Dr. W. J. Whitakar the first and the founder Director of IIP to the present Dr. M.O.Garg all have immensely worked towards shaping the institute to be a leader in its areas of research.

Dr. M.O.Garg who has been at the helm of affairs of IIP since 2003 has led the institute from strength to strength. Under Dr.Garg the institute has diversified and internationalised in its areas of research. The diversification has been in the areas of bio-diesel, bio mass, bio technology, solar. International collaborative research has also seen an upswing under his tenure. A record number of 53 MoUs have also been signed since Dr.Garg has taken over.

Dr.Garg is a gold medallist in B.Tech.(Chem.Engineering) from Nagpur University, M.Tech in Chemical Engineering from Indian Institute of Technology (IIT), Kanpur and a Ph.D from University of Melbourne, Australia where he also served as a faculty. He has had an illustrious career in the field of research and development having worked both in the public and private sector prior to taking over the reigns of the institute.

Dr.Garg is an acknowledged expert in the area of liquid-liquid extraction, advanced controls, simulaton & modelling and process integration, with specific application to the refining industry. Dr.Garg has contributed immensely to the development and growth of the Indian hydrocarbon industry and possesses the unique capability of conceptualizing development and implementation of new research ideas.

Although every employee of IIP has contributed to the growth of the Institute since its formation, yet this document will be incomplete if the contribution of some of the main scientists is not mentioned. In the evolution of IIP, these people led the Institute from its auspicious and humble inception to the golden jubilee year of its glorious existence shouldering responsibility at every juncture.

The formative days (1960– 1970)

The initial days for the newly formed IIP were quite challenging as they would have been for any new organisation starting from

scratch.

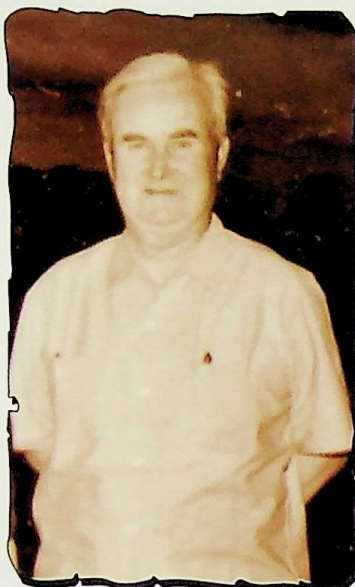
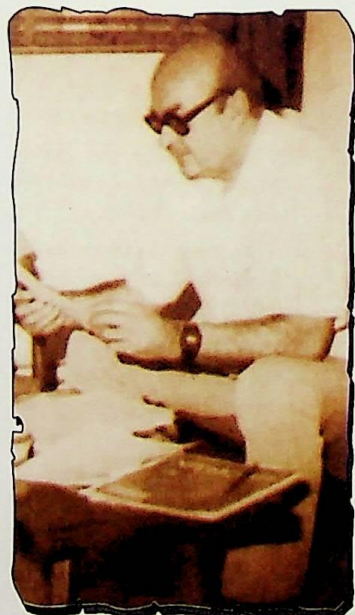
The first obvious challenge was to locate a person to shoulder the responsibility of physically setting up the institute.

India's search for an able person zeroed in on Dr. J.W. Whitakar, an Englishman who was in India as an Advisor to CSIR invited by the late Dr Shanti Swarup Bhatnagar. Dr. Whitakar was a renowned expert in the field of fuels and mining and had helped CSIR establish the Central Fuel Research Institute and Central Mining Research Institute both at Dhanbad.

In view of great success in setting up of the aforesaid institutes and his own expertise in liquid fuels Dr. Whitakar was called in to establish the newly conceptualised IIP. He gladly took up this challenge in November 1960 and created history.

Initially as an Officer on Special Duty and subsequently as the first and the founder Director, Dr. Whitakar got down to the job of planning and setting up of IIP. His tasks were gigantic as the best of brains were needed to assist him in his efforts. To get the best scientists to work with Dr. Whitakar, India signed an agreement with the IFP and French government to assist India in this task.

The agreement followed a French technical mission; group of 12 experts, from France headed by Yues Laurant Gladel reaching India in 1960 to assist Dr. Whitakar in his efforts to set up IIP.

The first batch of 3 young scientists was included in the newly formed IIP in November 1960

Dr. J. W. Whitakar

Yues Laurant Gladel

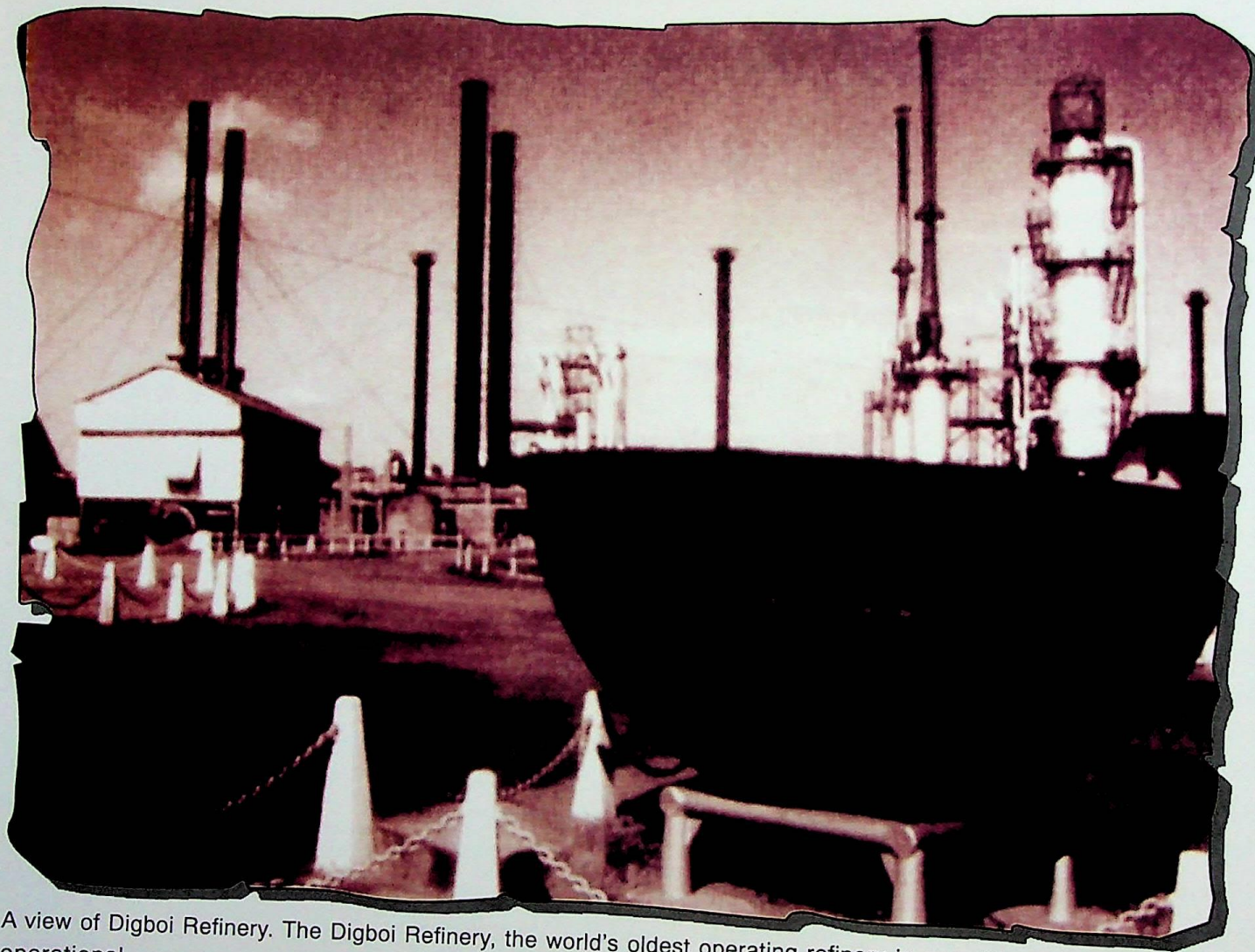
while the second batch of scientists was inducted in 1961.

The Institute received its initial grant through UNDP in two phases. These aids greatly supported the activities of the Institute including strengthening the Petroleum Product Applications Division.

Dr. Whitakar and his team of experts laid out the first mandate of the institute keeping in view the vision of the Indian Government in setting up IIP. The layout of the building, its various research laboratories as also staff recruitment plans were also initiated by him. However without waiting for its full fledged building to come up Dr. Whitakar along with his French counterparts and the new recruits got down to business from a Block allotted to them in the building of the Central Road Research Institute (CRRI), another CSIR laboratory at New Delhi.

Initially three divisions were planned i.e. Petroleum refining & petrochemical, Petroleum product development and testing and chemical and intermediates.

The first task in front of the newly formed IIP was to get acquainted with the petroleum industry in the country. Petroleum refining industry was a very small industry that time. There was a small refinery in Assam at Digboi of 0.5 mmtpa.

In 1960's two refineries came up in Bombay (one of Burma Shell and the other of Esso) and later a third small refinery came in Vishakapatnam.

A view of Digboi Refinery. The Digboi Refinery, the world's oldest operating refinery is over 100 years old and still operational.

Around that time ONGC which was already in existence found some oil in Assam around Nahorkatiya area. In 1960-62 the government decided to establish two refineries, one in Bihar (Barauni) and the second one in Guwahati Assam. IIP Scientists under the guidance of Dr. K.K.Bhattacharya the then Senior Scientific Officer Grade I started working on the petroleum industry's problems and its initial planning for establishing the various IIP laboratories.

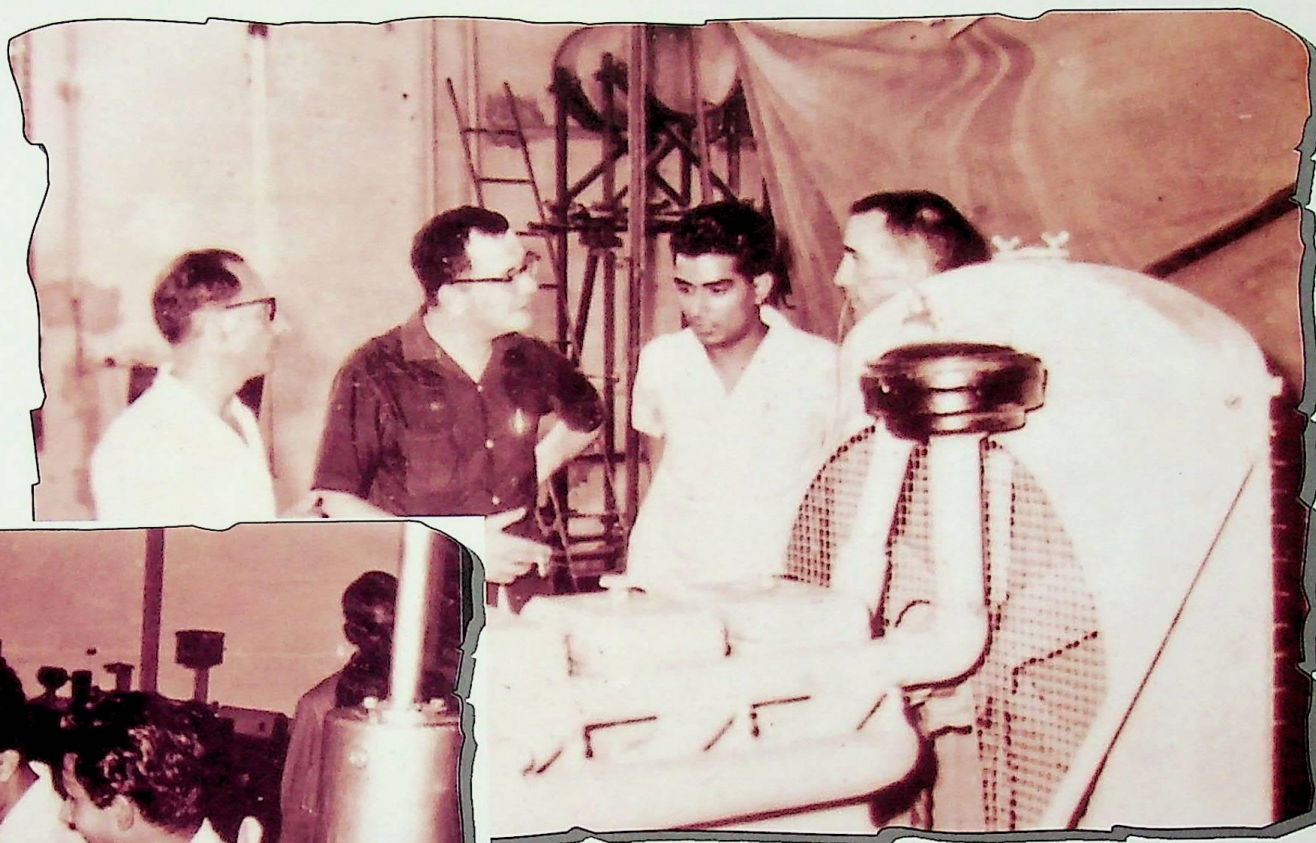
The first task given by the then petroleum ministry was to help in the training of the engineers recruited for Barauni and Guwahati refineries set up with foreign collaboration. It was greatly felt that the Indian scientists need to be trained. IIP organised the first refining courses at Delhi during end of 1960 in a rented accommodation at the Bhartiya Vidhya Bhavan. The course attended by 27 participants focused on theories, technologies involved in refining, refinery practices and challenges. It was totally industry oriented course.

The institute which even today holds a unique position in research and training was in those days considered an apex learning body which had specific courses of different durations like two years or even short duration six months courses and so on.

In-fact training of cadres for the petroleum industry was a very important task assigned to IIP which it successfully shouldered

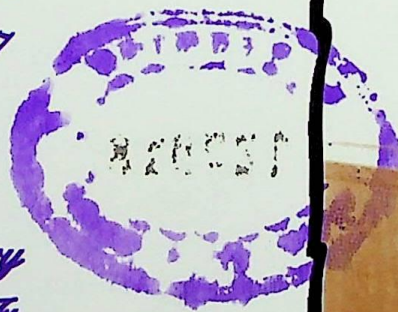
during those days in spite being a very young institute. This immensely helped the industry.

It is said that there would hardly be any chemical engineer in the oil refining in India today who has not had some training or interaction at one time or the other at this institute.

The faculty of the first course consisted of French experts, scientists from IIP and some from the academic institutions. This course was followed by several other courses. The faculty in the other courses during the initial days were scientists of IIP, experts from IFP France and even from Burma Shell refinery ESSO refinery, Caltex refinery.

Chief Representative of Burma Shell visit IIP on 13.10.1963

Chief Representative of Burma Shell visit IIP on 13.10.1963

The important role and contribution of the Insitut Francais du Petrole (IFP) and its experts in developing its activities were note worthy. The first phase of the collaboration between IIP and the IFP was completed and subsequently extended in specific areas for another three years. The project for producing

The first task given by the then petroleum ministry was to help in the training of the engineers recruited for Barauni and Guwahati refineries set up with foreign collaboration. IIP organised the first refining courses at Delhi during end of 1960 in a rented accommodation at the Bhartiya Vidhya Bhavan. The course attended by 27 participants focused on theories, technologies involved in refining, refinery practices and challenges. It was totally industry oriented course.

The first big achievement came IIP's way in 1962-63. The late Pandit Keshava Deva Malaviya decided to have a refinery in south India after the establishment of refineries in Mumbai in the early 1960's. He gave IIP the task of market survey and preparation of the preliminary report for a proposed refinery in south India.

IIP formed a group of four scientists. The group consisted of a French expert Mr. Baker, Dr. J.S. Ahluwalia (he was then an officer in the Ministry of Petroleum and later joined IIP), Dr. K.K. Bhattacharya, Senior Scientific Officer Grade I, IIP and Mr. M. Kurien a senior scientist of IIP with experience of being involved in refining operation in Saudi Arabia. This group was further divided in two sets to tour all the four States in south India. Mr.Baker and Dr. Bhattacharya went to Andhra Pradesh and Tamil Nadu while Dr. Ahluwalia and Kurien went to Karnataka and Kerala to get a preliminary picture of the possible refinery set up based on the consumption factor of the States. That was IIP's first task of data collection and possible location identification. The two groups after a detailed survey submitted their reports. This was the first ever report on project and refinery planning done by IIP.

The report suggested a refinery of 2 million tones capacity for Cochin, Kerala. However the report also mentioned that in case of a bigger refinery of 2.5 or 3 million tones the government could think of setting it up in Madras. Both these locations were suggested taking into view the crude movement aspects.

The government which accepted IIP's recommendations was extremely satisfied with this report being done so professionally by a very young Institute. This was indeed a turning point for the Institute.

Visiting dignitaries from ESSO on 10.12.1963

Though IIP's technical collaboration with Francais de Petrole (IFP) lasted four years; however, the link with IFP continued for many more years through the channel of IFTA, an association of Indian scientists in France.

The first big achievement came IIP's way in 1962-63. The late Pandit Keshava Deva Malaviya decided to have a refinery in south India after the establishment of refineries in Mumbai in the early 1960's. He had some talks with the American refiners, but the refinery size, location, feed stock and product supply did not seem very clear to him as suggested by the Americans. He gave IIP the task of market survey and preparation of the preliminary report for a proposed refinery in south India.

protein concentrates from petroleum fractions was taken up under this extension. IIP and IFP also collaborated in the development of process such as hydrodesulphurization, catalytic reforming, etc. with a view to offer them as joint processes in India and other countries; the process for hydrodesulphurization of gas oil was already being used in Madras Refinery.

IIP formed a group of four scientists. The group consisted of a French expert Mr. Baker, Dr. J.S. Ahluwalia (he was then an officer in the Ministry of Petroleum and later joined IIP), Dr. K.K. Bhattacharya, Senior Scientific Officer Grade I, IIP and Mr. M. Kurien a senior scientist of IIP with experience of being involved in refining operation in Saudi Arabia. This group was further divided in two sets to tour all the four States

A Clever Trick

The transition of IIP from New Delhi to Dehradun was not quite smooth in the beginning as there was an opposition by the staff on shifting the institute while few wanted to delay it on the pretext that the new campus of the institute at Dehradun was in isolation away from the civilization, around 6-8 kms from the town, amidst jungle area which was most vulnerable due to wild animals like tiger, leopards, wild boars, wild elephants bear, wolfs, jackals, snakes etc.

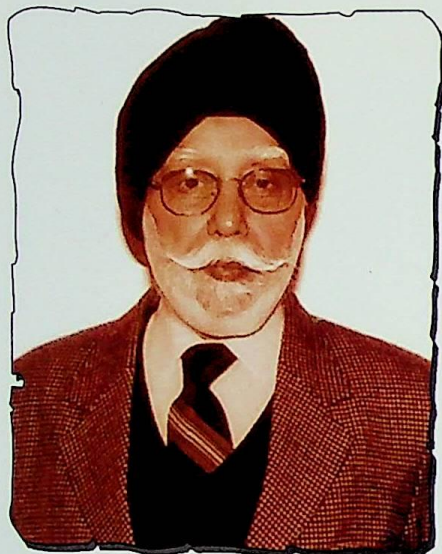
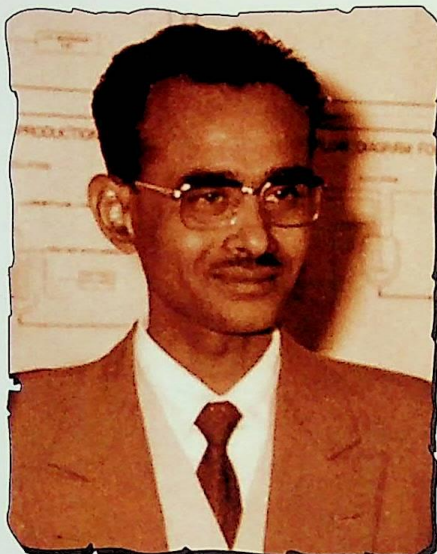
The location of the institute, no doubt, was in a fairly dense jungle and at night the scary howl of the jackals, hooting of the owls or screeching of bats was very common.

The jungles in the vicinity of the institute is presently not that thick what it used to be in the early 1960, nor many animals now dare to enter the campus because of considerable urbanisation of the surrounding yet stray incidences of leopard entering the campus have come to light.

No efforts of the staff on the aforesaid pretext succeeded to dampen the decision of the authorities to shift the institute to its designated headquarters at Dehradun.

To change the perception of the people towards the new campus of IIP, a clever trick was worked out by the office bearers of the then IIP Club at Delhi who proposed to arrange a picnic-cum-sight-seeing trip to Dehradun. This was done, without telling the motive behind the picnic-cum-sight-seeing trip to the place where the shift of the institute was proposed. The trip was organised and most of the workers participated in it. There was a good feeling amongst them as they considered it an opportunity of going in for a leisure trip to Dehradun, little knowing that it had a dual purpose. The trip which was a grand success infused in the staff and workers a feeling to think in terms of shifting to Dehradun seeing the institutes picturesque location and serene environment.

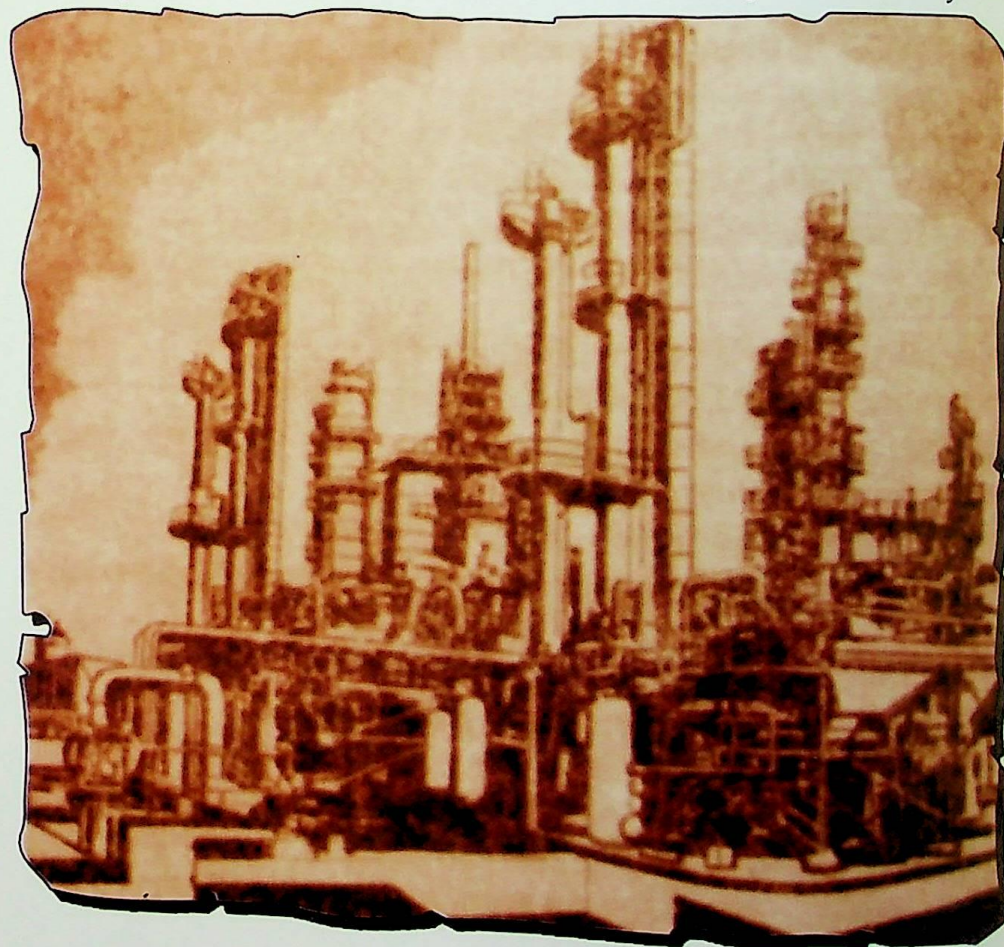
The clever trick worked.

IIP Staff enjoying a picinic organised by IIP Club at Dehradun in early 1960s

Dr. J.S. Ahluwalia

Dr. K.K. Bhattacharya

in south India. Mr.Baker and Dr. Bhattacharya went to Andhra Pradesh and Tamil Nadu while Dr. Ahluwalia and Kurien went to Karnataka and Kerala to get a preliminary picture of the possible refinery set up based on the consumption factor of the States. That was IIPs first task of data collection and possible location identification. Dr. Bhattacharya coordinated the whole work. The two groups after a detailed survey submitted their reports which were analysed to check the various parameters and recommendations of the experts. This was the first ever report on project and refinery planning done by IIP.

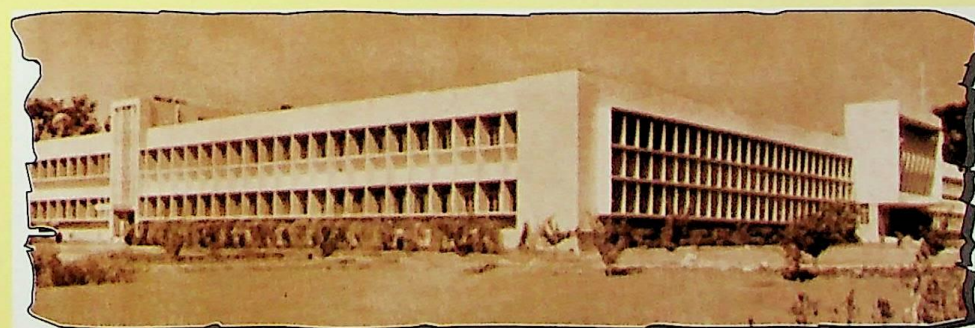
The report suggested a refinery of 2 million tones capacity for Cochin, Kerala. However the report also mentioned that in case of a bigger refinery of 2.5 or 3 million tones the government could think of setting it up in Madras. Both these locations were suggested taking into view the crude movement aspects as south India in those days did not produce any crude oil and any proposed refinery would have to import crude.

The government accepted IIP's recommendations and was extremely satisfied with this report being done so professionally by a very young Institute. This was indeed a turning point for the Institute.

Another important task IIP was called in by the government during the 1962 Indo-China war was to assist in providing a solution to the stranded Indian army vehicles in the snow clad regions because of freezing of the diesel. IIP's scientists from Product Development team were flown in to the help of the army. IIP

The New IIP Campus and Buildings

Like most institutes and organisations starting from scratch, IIP too made a humble beginning both at New Delhi where it initially saw the light of the day and subsequently at Dehradun from 1963 when it was allocated a huge and captive campus on Haridwar Road.

The location of the present campus of IIP was the efforts of Dr. Witaker. In 1959-60 he had his office on Lytton Road in Dehradun from where he was working to establish IIP. Though he saw many areas in Dehradun to set up the newly formed IIP, he did not approve to any of those as they lacked good utility supplies. Utility supplies for him meant adequate "water" and "power" supply. It was then that he came to learn that in Mokhampur tea garden there was ample of space next to a tea factory for setting up the institute. He visited the site to notice that next to the tea factory was a well (quite unlike of Dehradun) which in those days was full of fresh water throughout the year. In those days even villagers from around 4-5 kms areas were coming there to fetch water from the well. He thought if the well can have fresh water, the problem of water will not be there in the surrounding. He suggested to the government to purchase the whole land. It was subsequently acquired by the Uttar Pradesh government in 1959, and handed over to the CSIR for establishing IIP.

The huge expanse of real estate, on which IIP in Mokhampur stands today, was a flourishing tea estate owned by Inamullah family of the well-known Inamullah

(Top) Construction of IIP Building at Dehradun in early 1961. (Middle) The IIP Tech. Block in mid 1960s (Bottom) A view of the IIP main Building in mid 1960s.

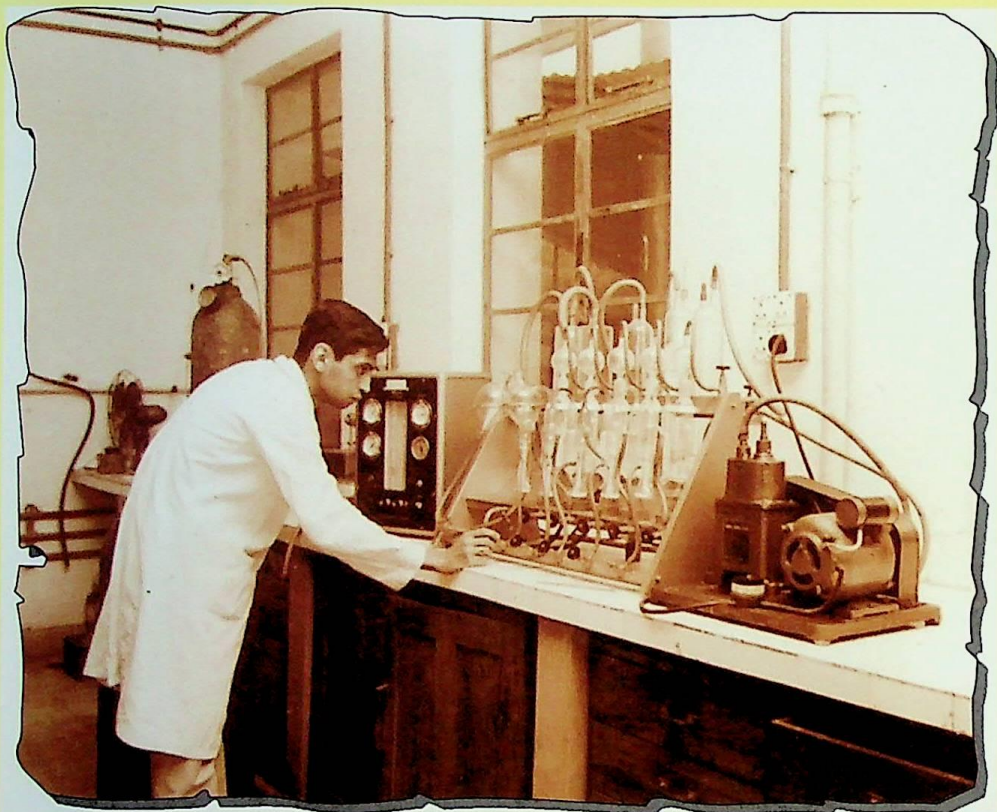
Building on Gandhi Road. The Tea Estate in 1959-60 comprised approximately 256 acres. IIP retained tea bushes in about 100 acres.

The campus also houses a very old and historic building which has been here since 1847. The building is of the sepoy mutiny era. This old building was know then as the 'Site office'.

On taking the possession of the land Dr. Whitakar got a tubewell dug near the tea estate quarters to find plenty of water. This was known as "Tube well No.1" which even stands today.

Next Dr. Witaker suggested construction of some Bays in the new campus where the skeletal staff could start functioning. There were 3-4 Bays, few rooms and some staff quarters constructed and the research work began.

It is learnt that the present building of IIP started getting constructed in 1961 but the work had to be suspended for some time due to national emergency in November 1962 on account of Indo-China conflict. However it resumed after a brief spell of time in May 1963. The first wing was completed in December 1964, and occupied by a part of the Refining and Petrochemical Laboratories and also by the Training Division of the institute in January 1965. The Technological Block came up in 1964, Main Building in 1965, Radio Tracer Laboratory in 1970, Engines Laboratory building phase I came up in 1965 while phase II in 1974, the Combustion Laboratory in 1984. The construction contracts were all awarded by the CSIR.

The first office building that was constructed at Dehradun was the Technical Block that now houses Engineering Service Division and the pilot plants. The main administrative building

came up later.

The earlier difficulties due to the lack of proper laboratory accommodation were largely overcome with the completion and occupation of the Institute's buildings in the first half of 1965. It was thus possible to set up comprehensive engine testing facilities and also to develop indigenous substitutes for the imported test benches and to develop them to a stage where they could be considered for adoption as Indian standards.

Dr. K.K.Bhattacharya (one of the veteran IIPians who

Pilot plant setup during mid 1960s

View of town gas pilot plant during mid 1960s

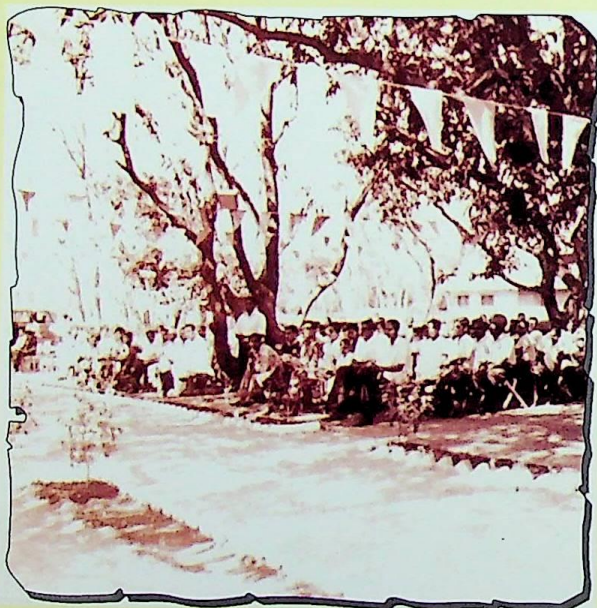
joined the institute in its formative days in the second batch of scientists inducted in early 1961 to remain here until his superannuation in mid 1980's) recollects, "We had initially many challenges to overcome. We worked in the Bays with little or no facilities. There were no ready to use technical apparatus initially for the research work. We purchased some, we built some. I personally built some glass apparatus with glass blowers in with my own hand."

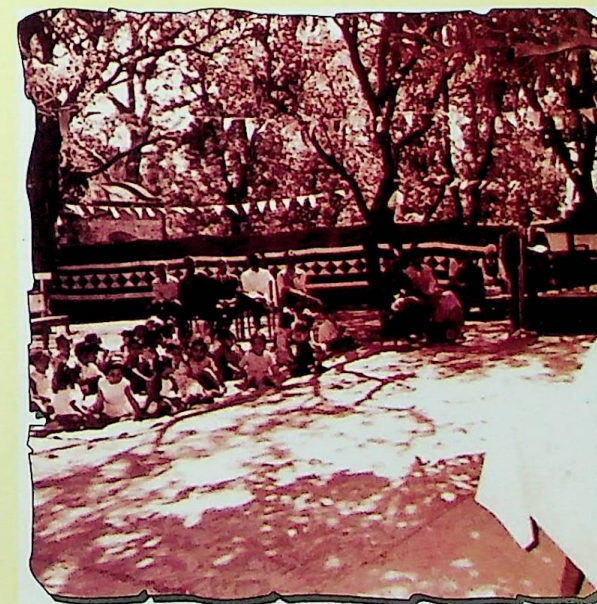
IIP Dispensary Building in mid 1960s

The whole civil engineering, planning work of IIP building was done by a very reputed British firms of those days established in Calcutta. The supervision and execution of IIP building's in the initial years was done by a IIP employees who was an ex army officer Major V. Tipnis. He was the Head of Civil engineering. Major Tipnis had great fascinations for keeping greeneries all around, flowers and planned space very well. His dedication and self confident was matchless. The reflection of his work can still be noticed in IIP campus.

Besides the major building work, construction of storage shed for storing bulk petroleum products, under-ground tank installations and fuel pumps for the Engine Laboratory, most of the roads, HT sub-station, and massive boundary walls to enclose the huge campus in the midst of thick jungles were carried out simultaneously.

A Fair Price shop, a Consumer Co-operative store, a Club, Staff quarters with a Post Office, Bank, a Hostel, a Guest House, Community Centre, a Dispensary, a primary school and a host of other smaller buildings against the backdrop of picturesque Shivalik ranges crowned with the Queen of Hills – Mussoorie subsequently came up.

Primary School run by the IIP Colony Welfare Association in 1966

Inauguration of IIP School on March 31, 1966

Inauguration of IIP School on March 31, 1966

The Early Birds

The early birds, who flew in the new IIP campus besides Dr. Whitakar, were Major V. Tipnis, Estate Manager, Shri. B.S. Sinha, Administrative Officer, Shri. G. Prakash and Dr. M. G. Krishna, and an ex-army driver, Shri. Puran Singh. Dr. Krishna was associated with the institute from its start as a Deputy Director and subsequently took over as its second Director from June 1964.

It was on April 14, 1963, the first batch of five young scientists Shri. Mool Chand, Shri.S.K.Ghosh, Shri Y.Kumar, Shri. P.L.Gupta and Shri. V.R.Sistas, bubbling with enthusiasm and determination to do something for the Nation, started their endeavour in the present premises at Dehradun.

With the coming of the first batch of scientific workers of the institute from Delhi to Dehradun on April 14, 1963, this day was started being celebrated by IIP Club and IIP Colony Welfare Association by organising a 'Mela' (fair).

IIP Colony Welfare Association organised a 'Mela' to mark the coming of the first batch of scientific workers of IIP from Delhi to Dehradun on April 14, 1963.

The location of the institute being in jungle surrounded by a tea garden, away from the civilisation, where it was difficult organising or even arranging for the necessities of life, the 'Mela' was always a grand event participated and enjoyed by one and all of the institute.

Besides research another task before the institute was to transform its campus, full of trees, tea bushes and snakes with vulnerability of wild animals into an area of human habitation, pulsating with life and congenial to an atmosphere conducive to the development of scientific research.

The first batch of scientific workers at the institute being mostly bachelors took this task in their stride and faced the challenges boldly. However with time the settlers worked hard with cheerful faces, braving lack of even basic amenities, managing to live as a compact and united family.

scientists found a solution and helped the Indian Army overcome the problem of freezing of the diesel in vehicles.

Providing a very concrete initial start to IIP, Dr.Whitakar demitted the Director's post in March 1963 to take over as an Advisor till April 1964 when he bid farewell to the Institute. He was replaced by an equally competent scientist Dr. M.G.Krishna who had been working shoulder to shoulder with Dr.Whitakar from the initial days of setting up of IIP as his Deputy.

Dr. Krishna was associated with IIP from its inception. He succeeded Dr.Whitakar first as the Deputy Director-in charge from April 1963 to June 1964 and subsequently as the Director from June 1964 to June 1974.

Dr. J. W. Whitakar along with his wife being bid farewell from IIP in April 1964.

His tenure was a period which saw the Institute being set-up in its true sense at Dehradun with all its research laboratories in place as per the vision of the Institute.

The Institute's capabilities both at the technical and policy levels gained increased recognition by the industry and the government under his tenure. The Institute even rendered advisory services to both the industry and the government. The crude oil evaluation remained a thrust area during his tenure.

On the research front the first laurels came IIP's way in the 1965-66. During those days the Barauni Refinery was facing problems in making quality grade kerosene and diesel.

They did not know what to do with around 80,000 tonnes of the aromatic extracts known as Aromax. They referred it to various CSIR laboratories including IIP for a possible solution

of converting this to basic aromatics.

At IIP Dr. Bhattacharya and his team of scientists were given this assignment. This group of young scientists set out to convert Aromax to basic aromatics. In couple of month's time this group of IIP scientists got the desired results before any other Institute could do.

IIP scientists used some catalytic process, thermal process with steam under hydrogen pressure for this technological innovation.

The French experts tested the results. To their surprise pure aromatics were coming out. They tested it repeatedly to see if the results were ok. Every time they tested they got the same results. After a through discussion and analysis, it was considered a break-through by IIP.

This competitive work in 1965-66 won the first laurels for IIP as also established the fact that a young laboratory like IIP had the potential of doing what even the established Institutes could not do. This reposed a great confidence of the industry in IIP and its scientists. This even spread the name of IIP far and wide.

Using this process developed by IIP, the Indian Oil Corporation showed financial interest in the erection of a pilot plant in the Barauni refinery for thermal reforming aromatic extracts for producing benzene, toluene and xylene. Similarly, a process for the hydro-desulphurization of petroleum fractions, jointly developed by the Institute Francais du Petrole and IIP was considered for the Madras Refinery Project in competition

Dr. W. J. Whitakar along with his wife and IIP scientists at the farewell funtion in April 1964.

Meeting of the Technical Sub-committee and Executive Council, IIP being held in February 1964

with well established processes. The Institute was also engaged in solving problems referred by refineries on matching refinery processing schemes with the product demand pattern and assessment of product quality.

Another significant research contribution by the newly established IIP was the detailed "work-up" of Ankleshwar crude processed by covering the evaluation of a series of blends which provided valuable data to Gujarat Refinery to tailor its production to the market requirements.

The Institute with these successes maintained close collaboration with the Refineries and Marketing Divisions of the Indian Oil Corporation, Private Sector refineries, the Ministry of Petroleum & Chemicals, the Defence establishments, the Railways, transport undertakings and industry and users in general.

With the expansion and diversification of the Indian petroleum industry in terms of setting up of the refineries, lube oil blending plants, additive plant and petrochemical complexes, IIP was called upon in 1965-66 to carry a heavier load than in the past years, more so as the expansion was largely in the public sector. The successful discharge of its functions was reflected in some measure by the close and effective cooperation received from the users of the Institute's services and expertise,

IIPians display patriotism

The mis-adventure India had with China in 1962 and subsequently with Pakistan in 1965 and 1970 saw a sprite of patriotism being displayed by a large number of IIPians. They felt the pain of their fellow countrymen who were confronting the enemies and their bullets on the boarder's of the country.

A wing of the Civil Defence was formed under the command of the then young scientists Dr. K.V.C.Rao and Dr. Himmat Singh. The members of the newly formed civil defence were so charged with a national feeling and a feeling of self belongingness towards the institute that they used to guard the institute campus in groups the whole of night to check the possibility of any infiltration by spies of the enemies. This fear loomed large and had gripped most of the important work centres and installations of government of India.

A Civil Defence volunteer of IIP in a real combat like mock training at the IIP Campus

Dr. Himmat Singh along with the then Director IIP inspecting the Civil Defence volunteers at the Campus.

To sharpen their skills in the field of self defence, the Civil Defence volunteers of IIP were trained with the support of NCC Centre at DAV (PG) College at Dehradun. A live combat like

situation was also created in the institute campus by its Civil Defence team with the assistance of the local administration and NCC/ defence forces of the country to familiarise its members and even other staff of the institute to safe guard themselves, their institute in the face any sudden attack by the enemy. Everybody at the institute, young and old, male and females were ready to do anything to foil any misadventures of the enemy towards their institute. Though no untoward incidence happened but it displayed the great love and dedication of the people of the institute towards their country and their work place. All this happened in back ground of the fact that just couple of years back the same people who were agitating to move in the new campus of the institute were now ready to sacrifice their lives for it.

The real combat like mock training programme exposed the participants to real gun battle in an artificial battle ground surrounding. All this was done in a secluded part of the institute campus.

Civil Defence volunteers of IIP in a real combat like mock training at the Institute Campus. Main building of IIP is also seen in the photo.

IIP Club

IIP Club was looked upon by the staff for some sort of pass-time, recreation and a place where they could have occasional get-togethers. Away from the city, the liking for IIP Club increased by the then IIPians.

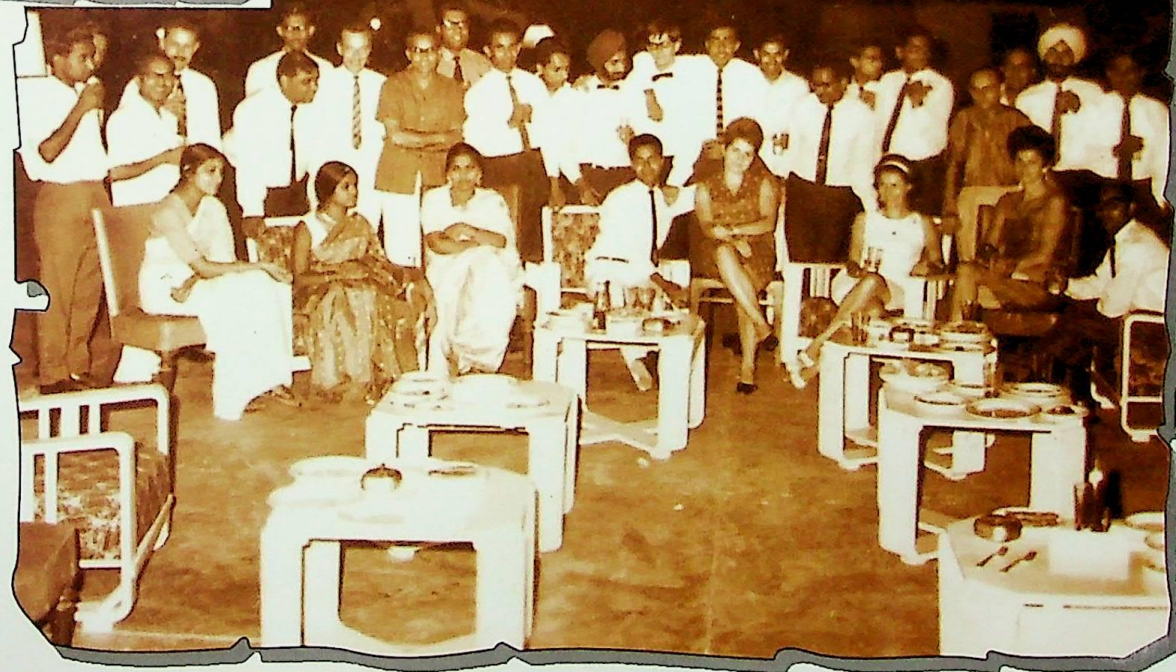
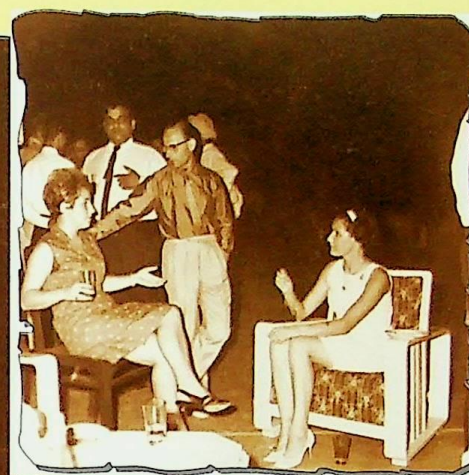
The Club accepted the challenge of breaking the monotony of life of the staff of the institute living specially in the colony. In a short time the club assumed the shape of a full-fledged recreation centre wherein facilities for both indoor and outdoor games like Table Tennis, Carrom, Badminton, Tennis, Football, Cricket etc were provided. With the growing of its popularity it started functioning both in the city as well as in IIP Colony. Even the house-wives were seen participating in most of

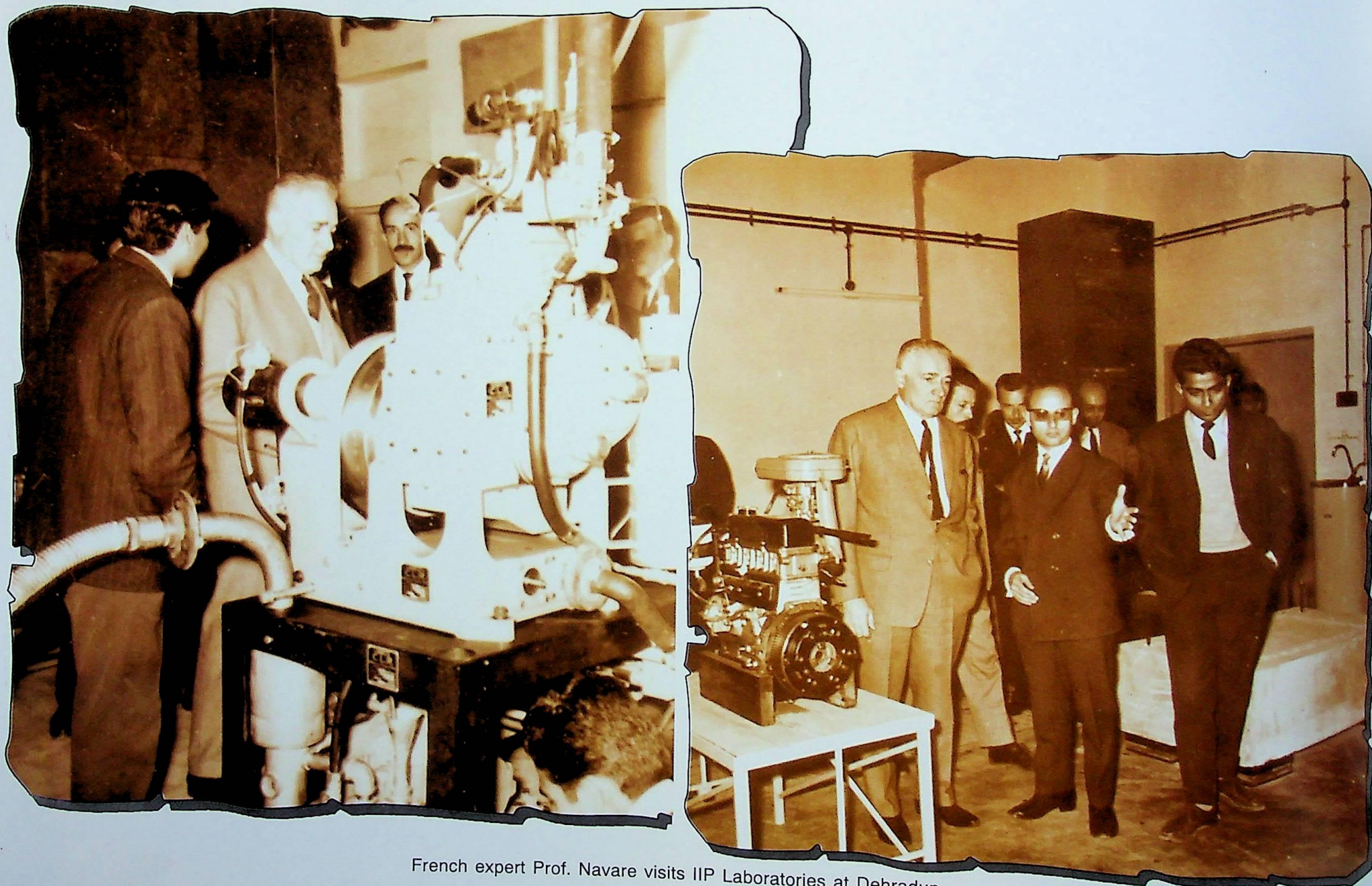
IIP Club celebrating an "International Evening" a gala function of the 1960s

the activities of the club with children becoming equally enthusiastic about the club activities.

The club was commended even by the residents of Dehradun not directly connected with IIP. They felt interested in the club activities of IIP and its cultural programmes were very well attended. Even local artists felt pleasure in giving performance on Club's request.

The keen interest French, Russian and other nationals working here attached to the institute was visible when IIP Club celebrated an "international evening" wherein music programmes from various countries were presented to the delight of the members of the club as well as to the invitees from the town.

In this way, IIP Club was not only providing the normal club activities but its efforts were going a long way in providing its members and their families, a reasonable sort of social life by arranging frequent cultural programmes, picnics, sports etc. and providing the much needed distraction from the monotonous life of the secluded IIP campus.

IIP Club celebrating an "International Evening" a gala function of the 1960s

French expert Prof. Navare visits IIP Laboratories at Dehradun

Mr. Pompideus and his team visits IIP at Dehradun.

French expert Prof. Navare visits IIP Laboratories at Dehradun

particularly the Ministry of Petroleum and Chemicals and the Refining and Marketing wings of the Indian Oil Corporation.

A large part of the Institute's work was undertaken on reference by users like Defence Department, Railways, small and medium scale entrepreneurs interested in the manufacture of speciality products etc., besides the oil industry in the public sector.

During the period 1966-67 the Institute attempted to consolidate itself in its permanent laboratories in Dehradun. Due to the severe economic recession and the shortage of foreign exchange, industry was forced to look to avenues of import substitution and development of indigenous processes. As a result, increasing numbers of such problems were referred to IIP leading to a substantial increase in its volume of work.

Director General CSIR visit during August 1965

The Institute was granted aid under the United National Development Programme (UNDP). The aid project specially devoted for strengthening of the Refining Division and the development of a Petro chemistry Division become operative in July, 1966.

The major part of the efforts during the year 1967-68 was devoted for evaluation of crude oils and products and process and product development.

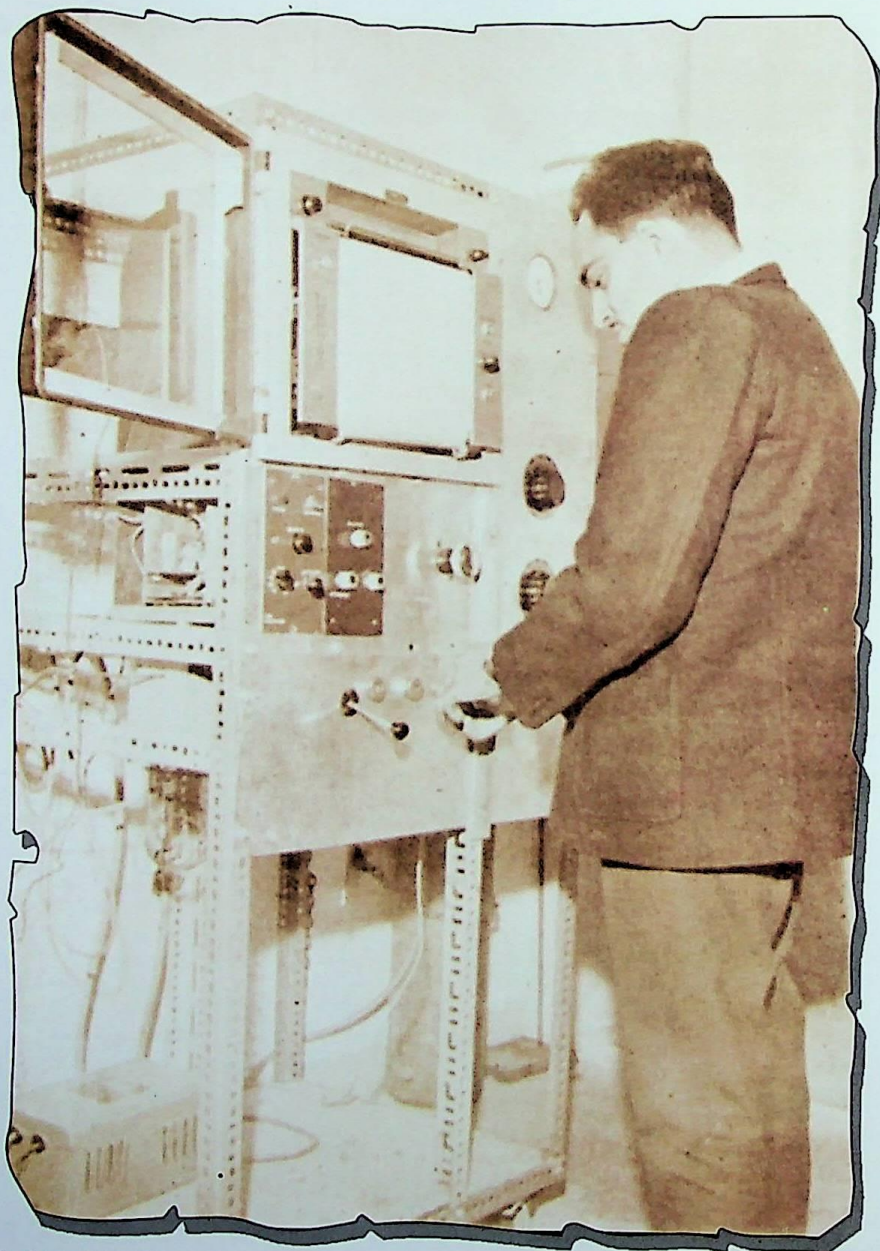
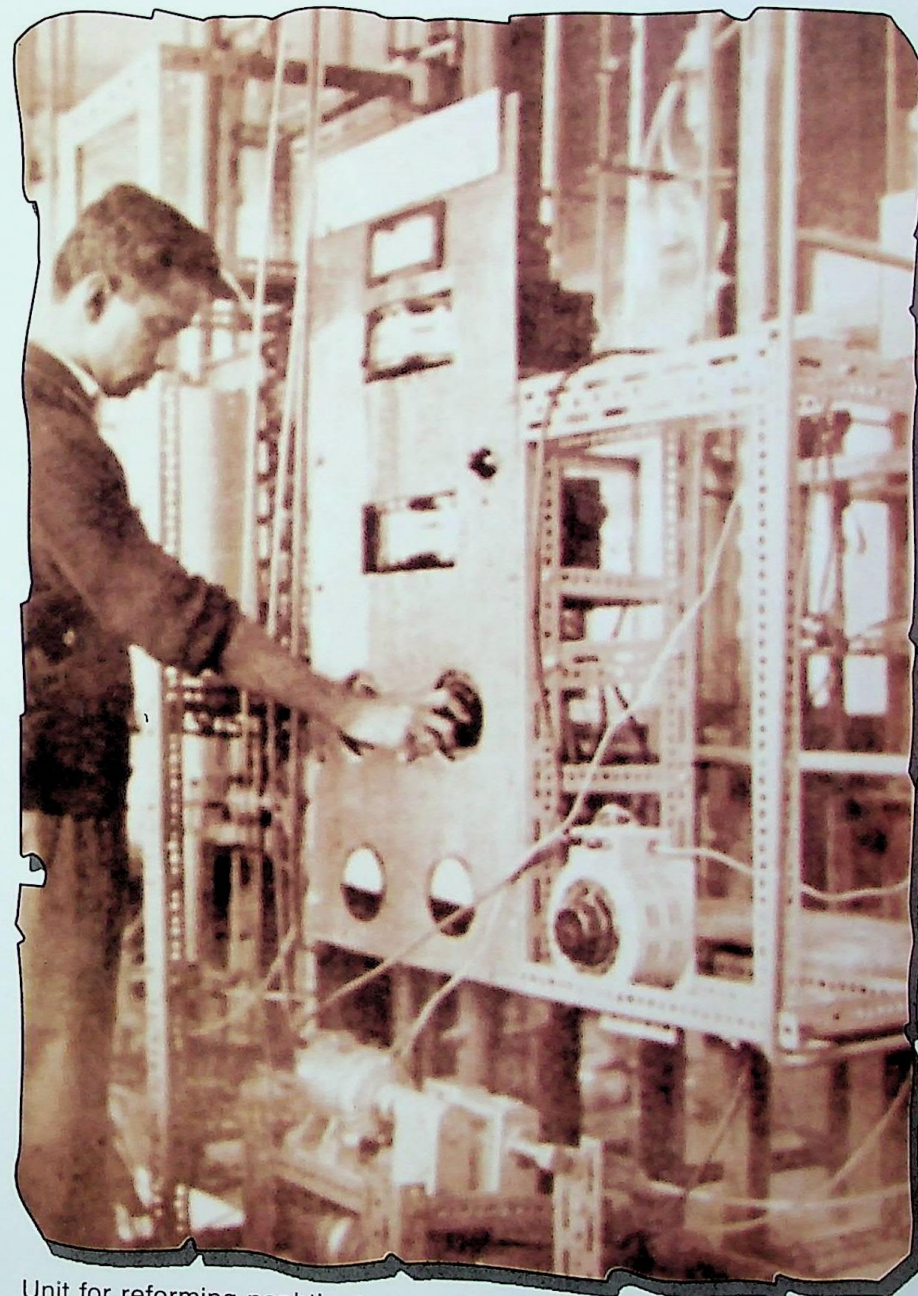
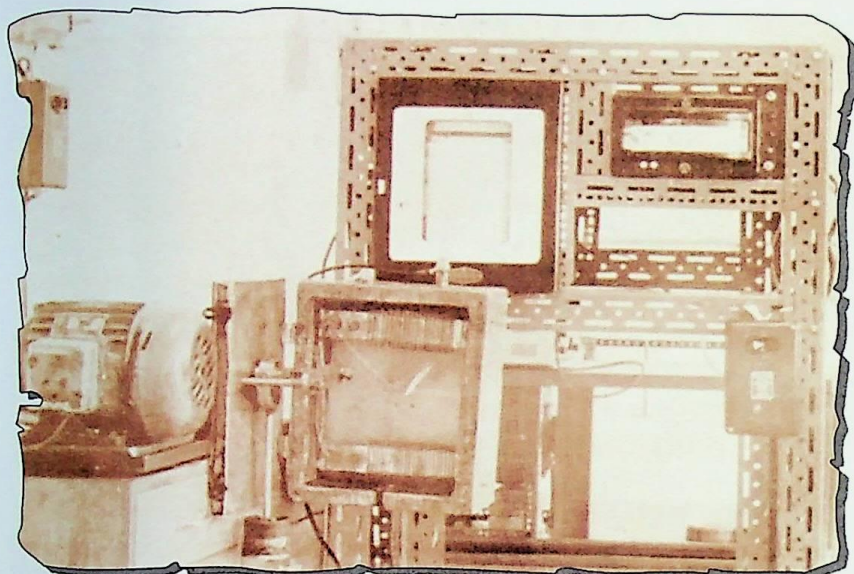
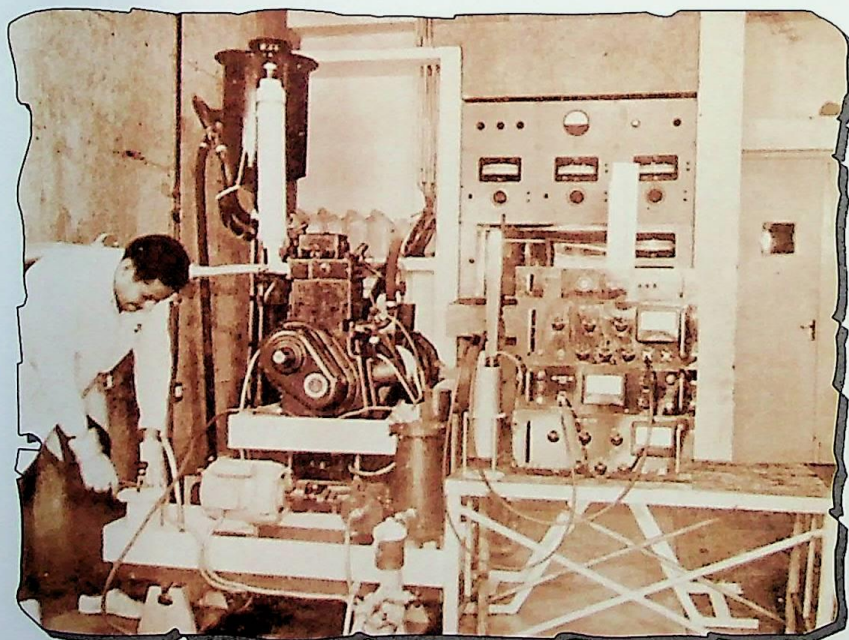
Some important projects received assistance under the UN Aid Programme through the services of foreign experts and the provision of training fellowships. Specialised equipments were also procured.

Work was also accelerated and increased in the fields of lube oil evaluation, catalytic reforming, hydrogen processing, speciality products and additives, process design, catalyst, performance evaluation of lube and fuels and protein from petroleum.

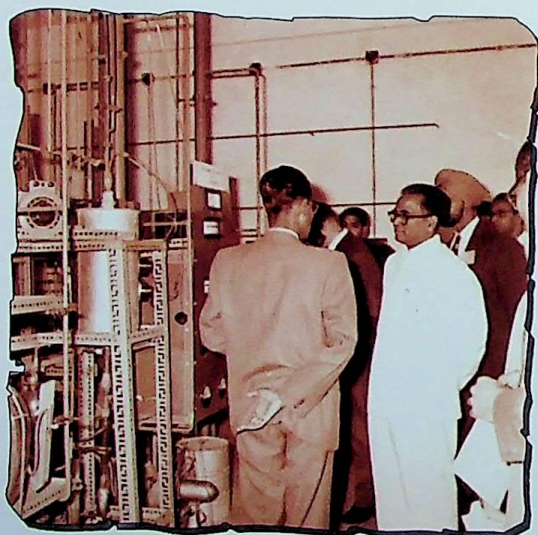
With the assistance received under the UNESCO Aid Programme during 1968-70, the Divisions working on catalysts, hydro-processing, refinery processes, polymers, analytical physics and process design were substantially strengthened through equipment, experts and training of staff.

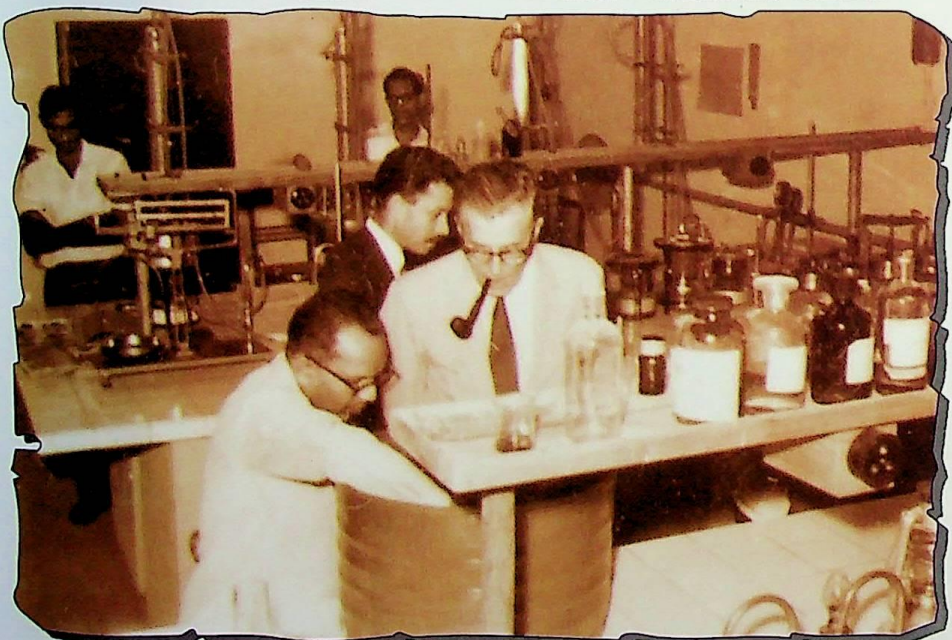
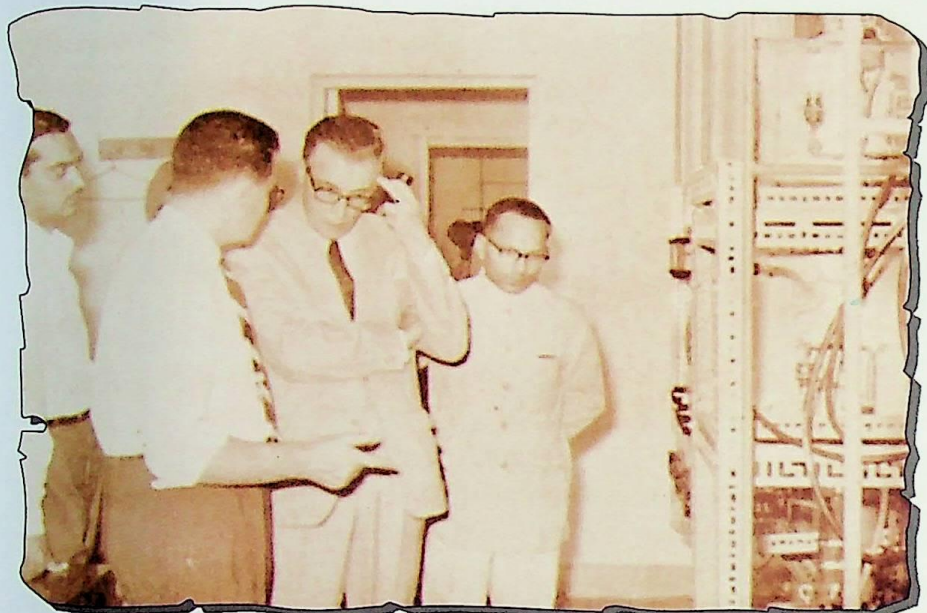
With the country importing North Rumaila (Iraqi) crude oil, the Institute's efforts during this period was focused on imported crude evaluation as large amount of this was to be processed in the existing and projected refineries.

IIP also organised three 15 month P.G.Diploma Courses in two disciplines one each during the years 1964, 1965 and 1966. The courses were on "Petroleum Refining and Petrochemicals" and

Director General CSIR visit during August 1965

Laboratory Gas Chromatograph designed and fabricated during 1965-66

Unit for reforming naphtha to town gas developed by IIP during 1965-66

Grease Test Rig at IIP during 1965-66

Radio-active Test Bench for Wear Studies at IIP during 1965-66

Test vehicle on chassis dynamometer at IIP during 1965-66

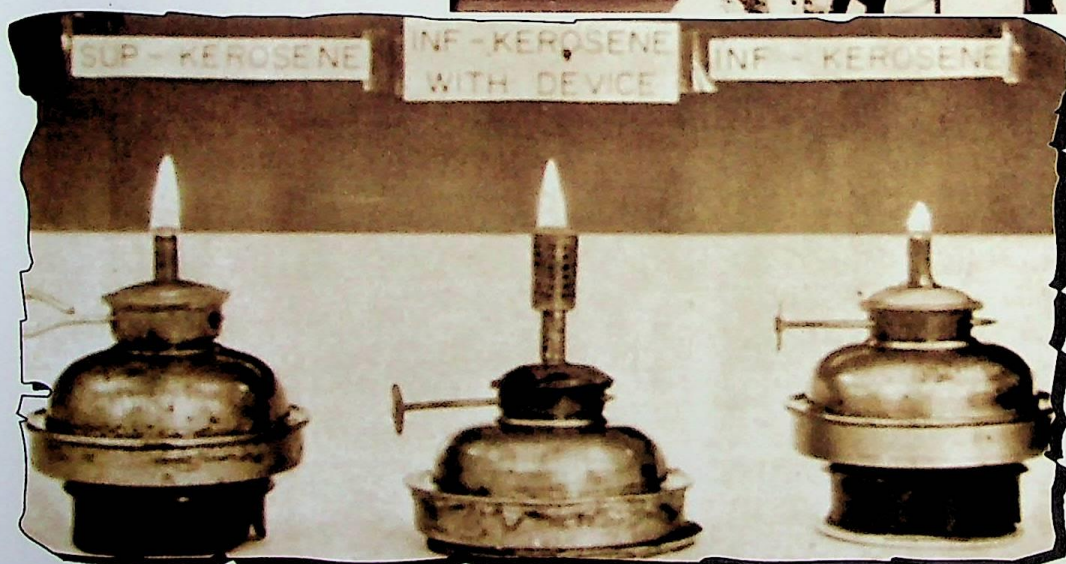
Shri O.V. Alagesan, Minister for Petroleum escorted by Shri M.G. Krishna, Director IIP on his arrival to inaugurate the Seminar on Hydrogen Production and Utilization in 1966.

Shri O.V. Alagesan at IIP Laboratory

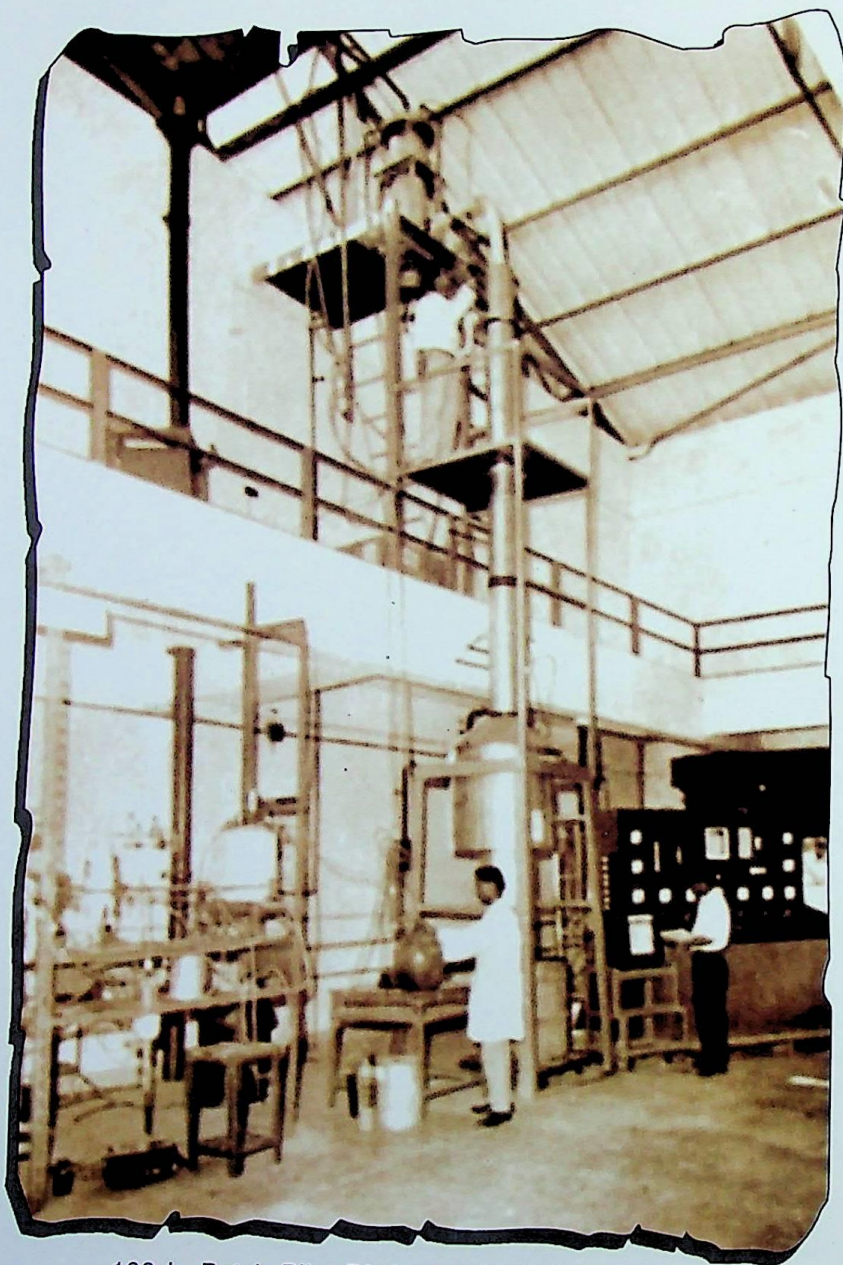
The Seminar on Hydrogen Production and Utilization in progress at the IIP auditorium

H.E. Jean Daridan, French Ambassador visit IIP during 1965-66

The Uttar Pradesh Health Minister arriving at IIP

The Uttar Pradesh Health Minister writing his comment in the Visitor Book.

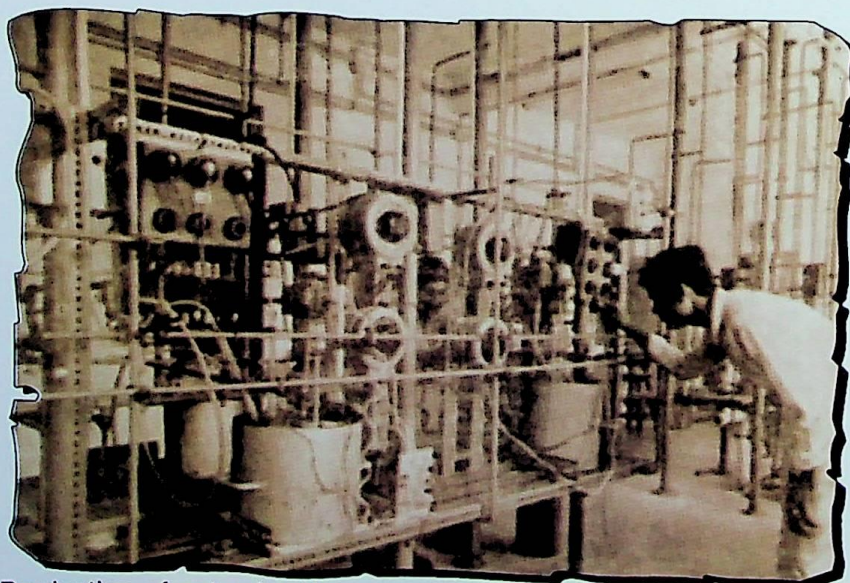
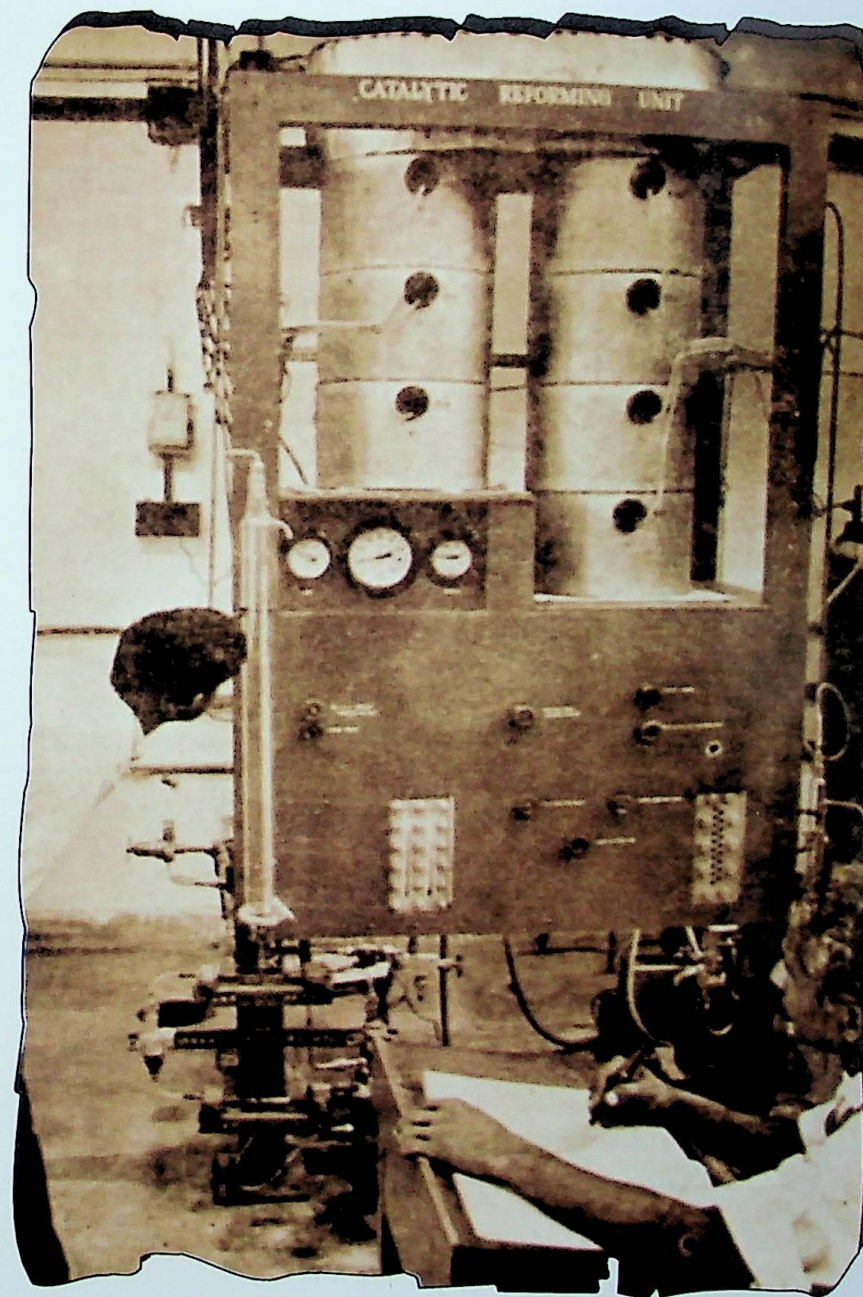
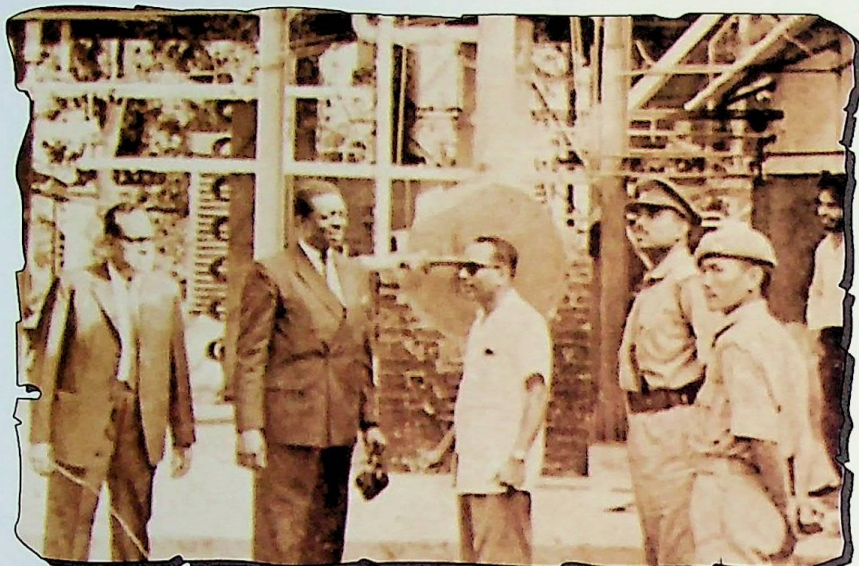
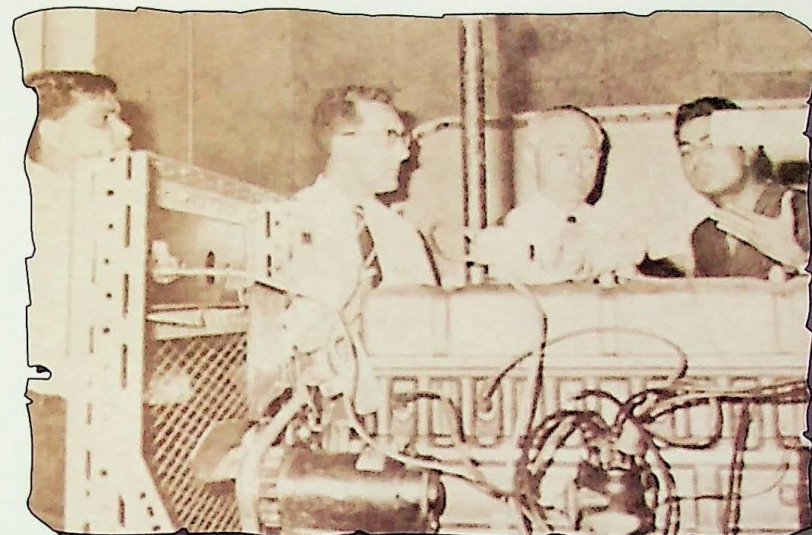
The Uttar Pradesh Health Minister visit IIP in December 1965.

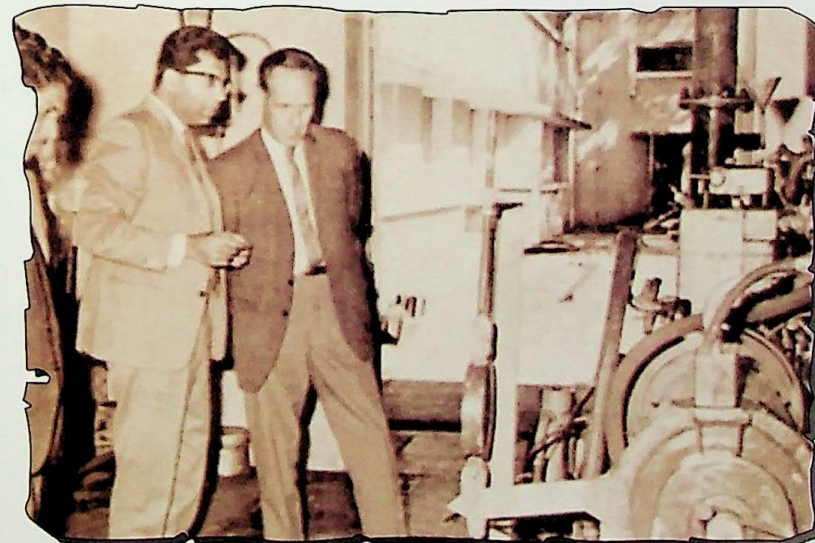
The then Health Minister of Uttar Pradesh addressing the IIP scientist during December 1965

Device for improving illumination from Simple Lamps burning inferior kerosine.

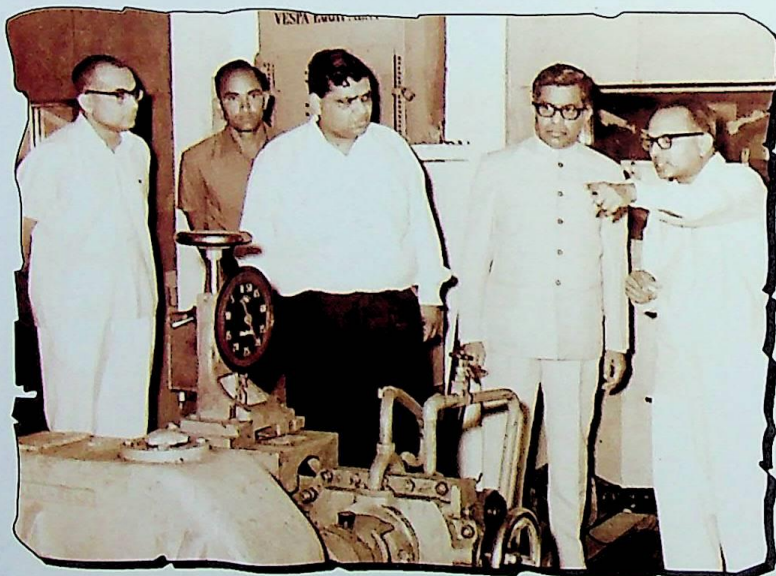
H.E. Ardeleanu, Rumanian Ambassador visit during 1965-66

100 L. Batch Pilot Distillation Unit during 1966-67

50 kg/day Pilot Plant for Producing Protein Concentrates from Petroleum Fractions recieved from IFP under Collaborative agreement.

French experts and MPs visit IIP during April 1964.

Visit of NEFA Chief

Production of natural rubber - styrene graft polymer by suspension polymerisation.

Catalytic reforming unit

Visit of Mr. Solomon AJ Pratt, Minister for Industrial Development, Govt. of Sierra Leone. He is being shown the pilot plant for naphtha gasification during 1970.

A Spart-Ignition Engine research Test bench (Photo shows: Shri P K Goel, Head, Products Application Divn., Dr. C. Thonon, Project Coordinator for UNDP Project, M. Jean Allegre, Commercial Counsellor, French Embassy in India and Shri R.A. Rao, Head, Engines Lab.) during 1970.

Visit of Nigerian Delegation during 1971

Prof. G. C. Eicholz, Regional Advisor of the UN Internation Atomic Energy, Agency, visiting the Radio-active Rig of the Engine Testing Lab.

Mr. C. Subramanian the then Minister Government of India on a visit to IIP during 1971.

Mr. C. Subramanian, visit IIP Laboratory

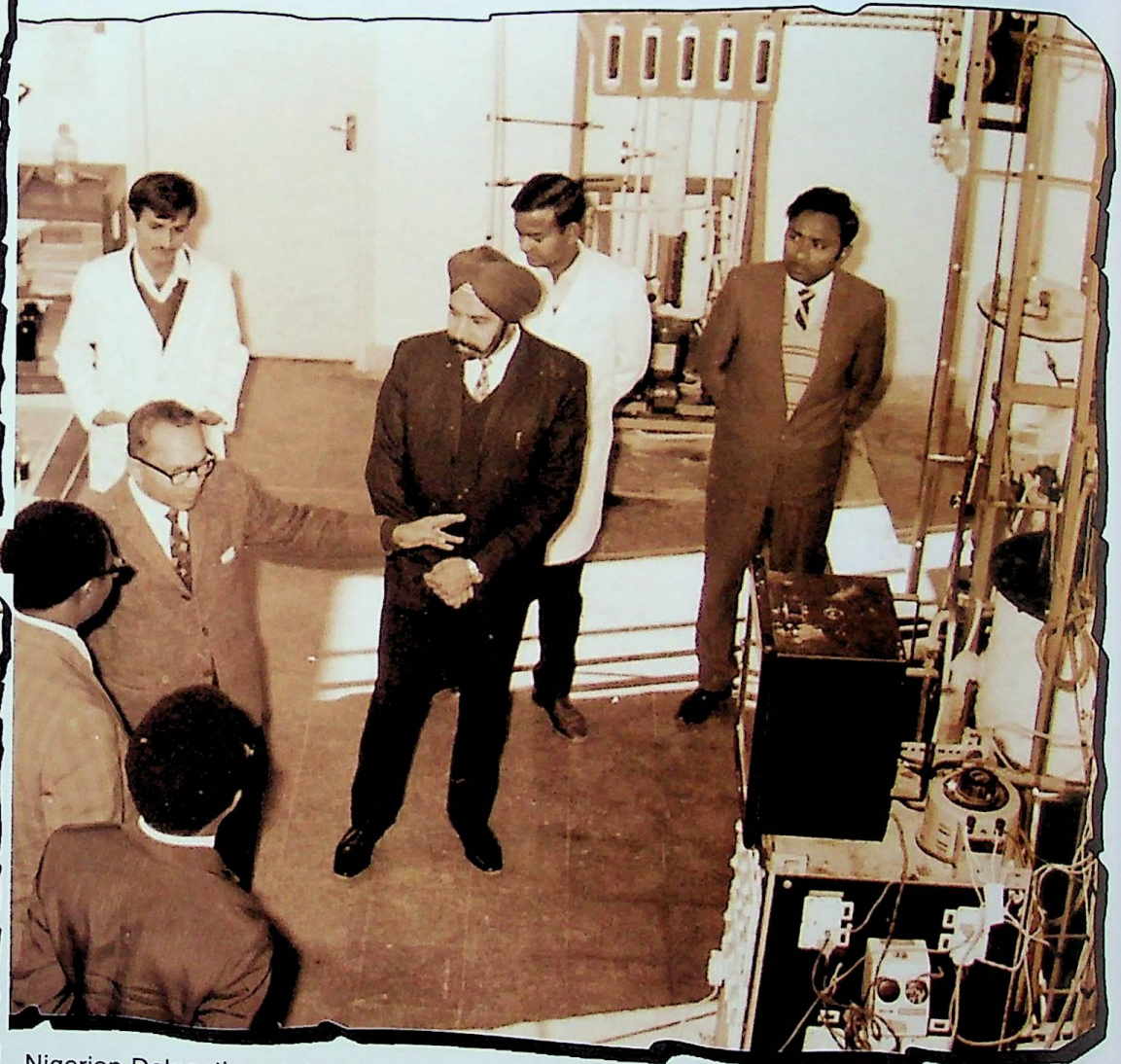
Dr. K. K. Bhattacharaya, explains a process to Mr. C. Subramanian during his visit

Mr. C. Subramanian taking salute of the IIP Civil Defence/NCC troup.

Mr. C. Subramanian unfurling National Flag at IIP

A Phillippines delegation during 1971

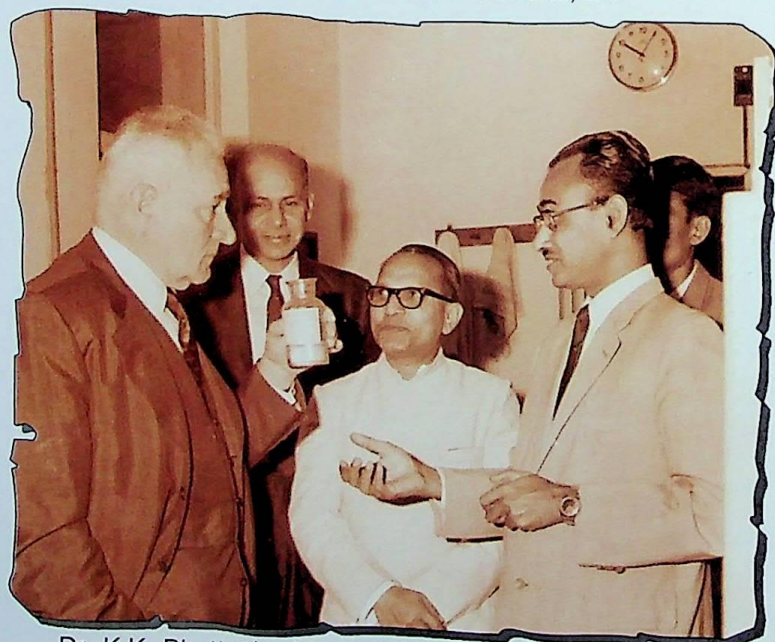
Nigerian Delegation

Nigerian Delegation led by the then Permanent Secretary of Nigerian Ministry of Planning and Development.

Nigerian Delegation at the IIP Laboratory. The then Director IIP explaining a process to the visitors.

Visit of Ghana's Minister of land and Natural Resources during early 1970s.

The then Director IIP explaining a process to the visitors.

Visit of Ghana's Minister of land and Natural Resources

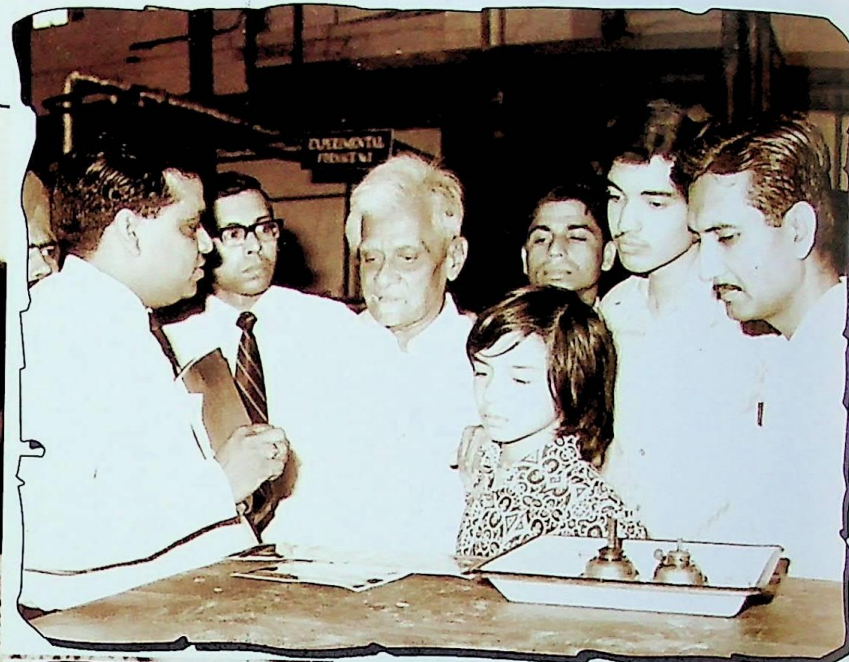
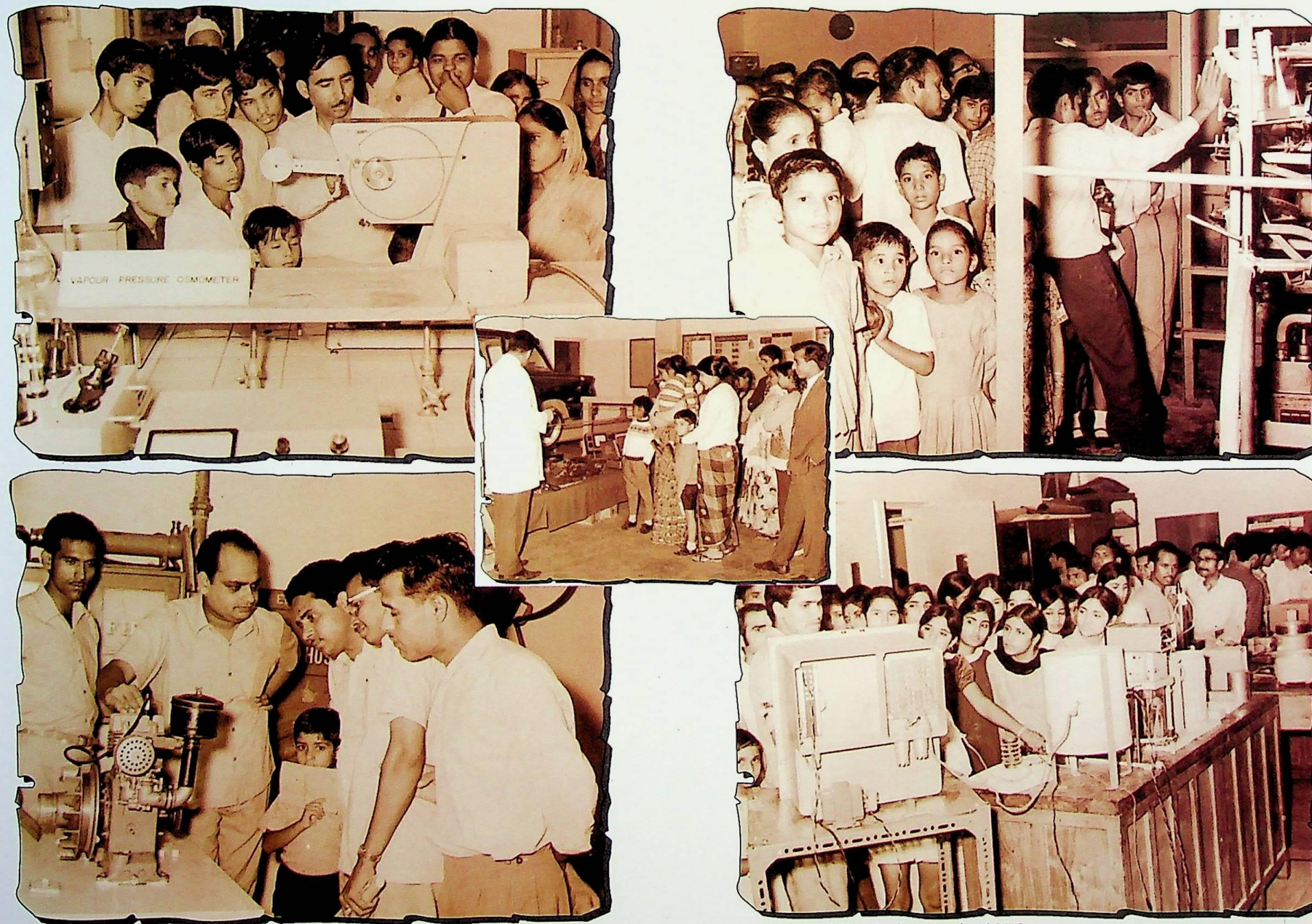
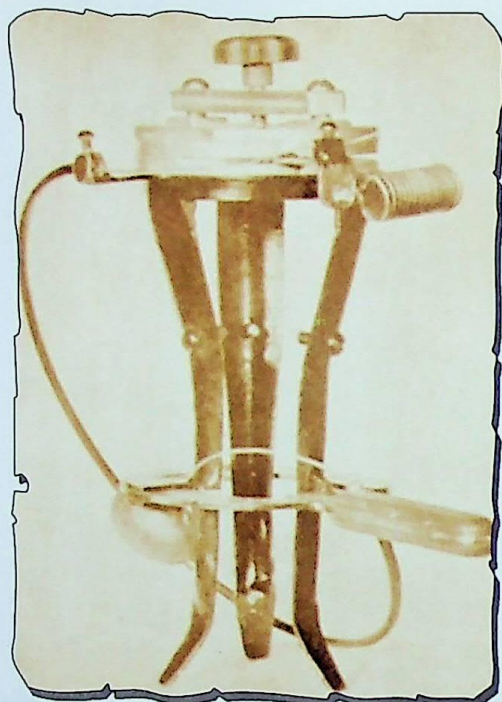
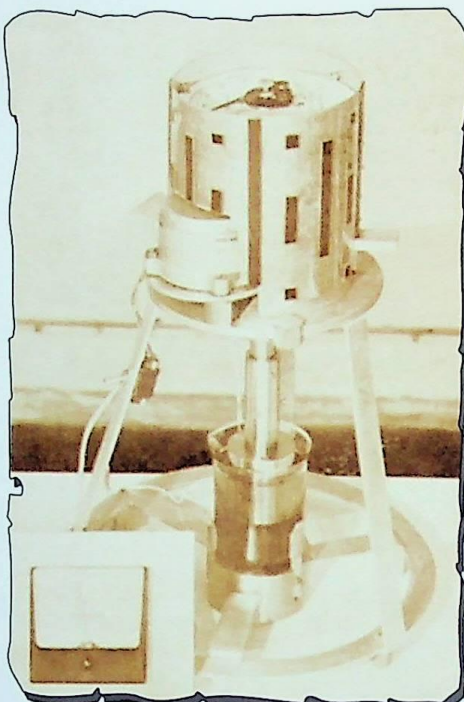
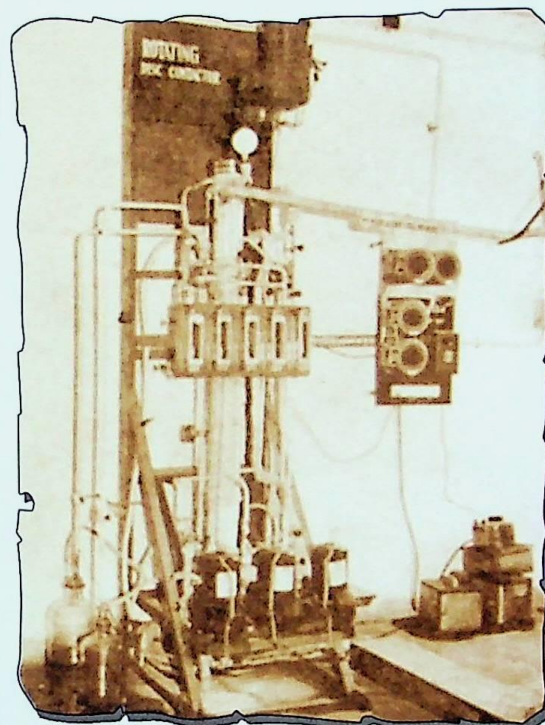
Visit of the then Director General, IFP

Dr. K.K. Bhattachariya explaining a process to DG, IFP

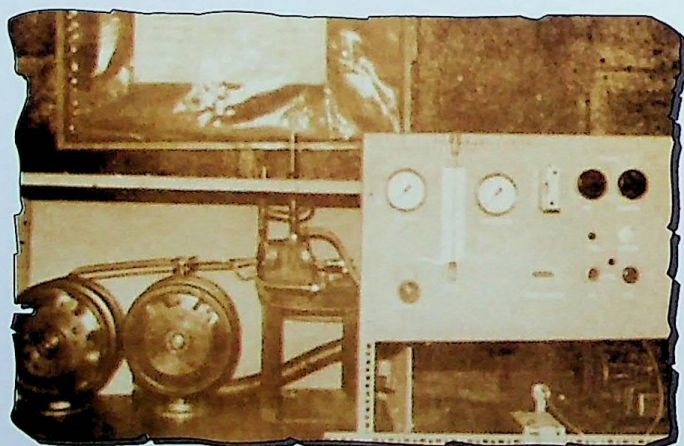
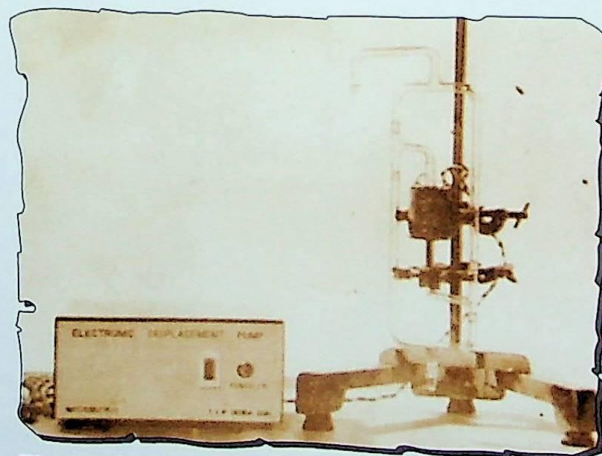
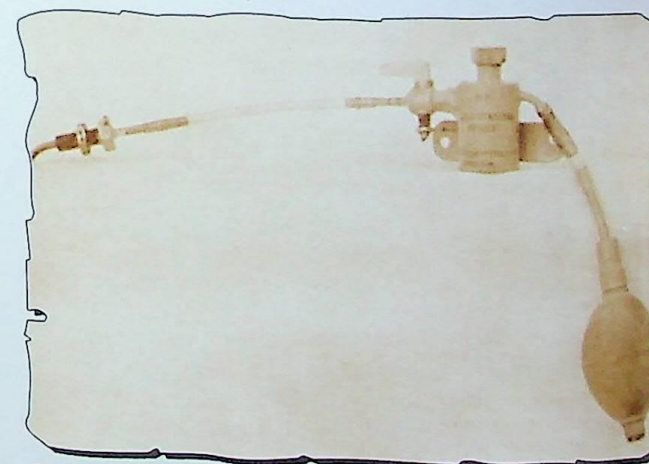
DG, IFP taking a keen interest in a research process

DG, IFP being introduced to IIP scientists

DG, IFP in IIP Laboratory

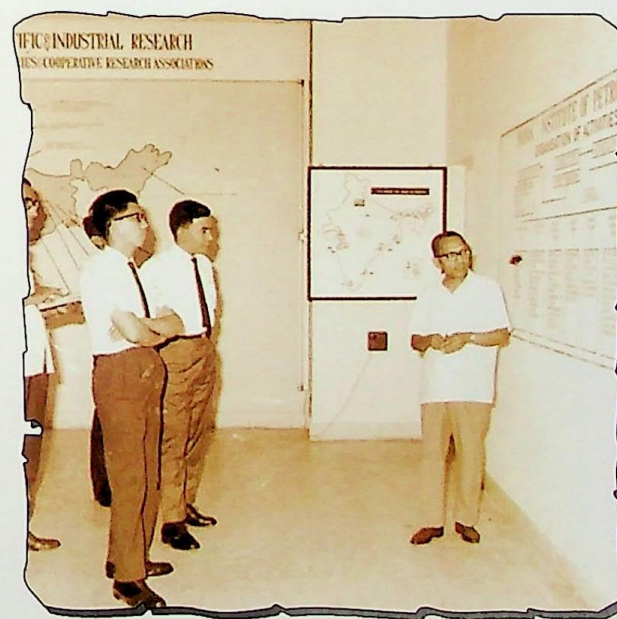
The then Bangladesh Government officials visit IIP during 1972

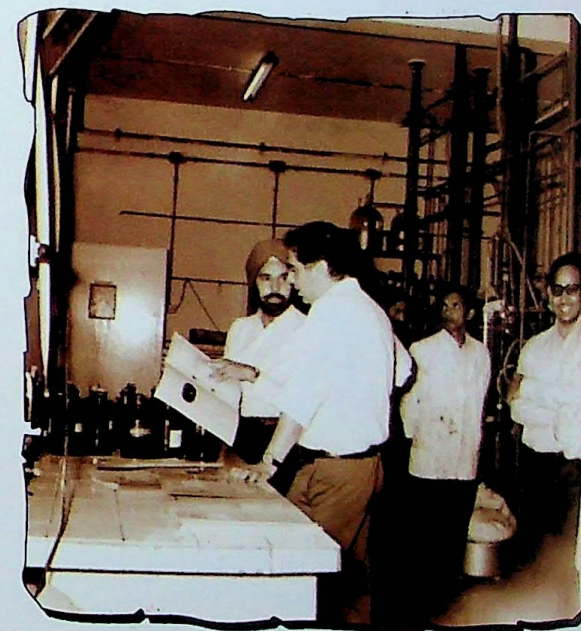
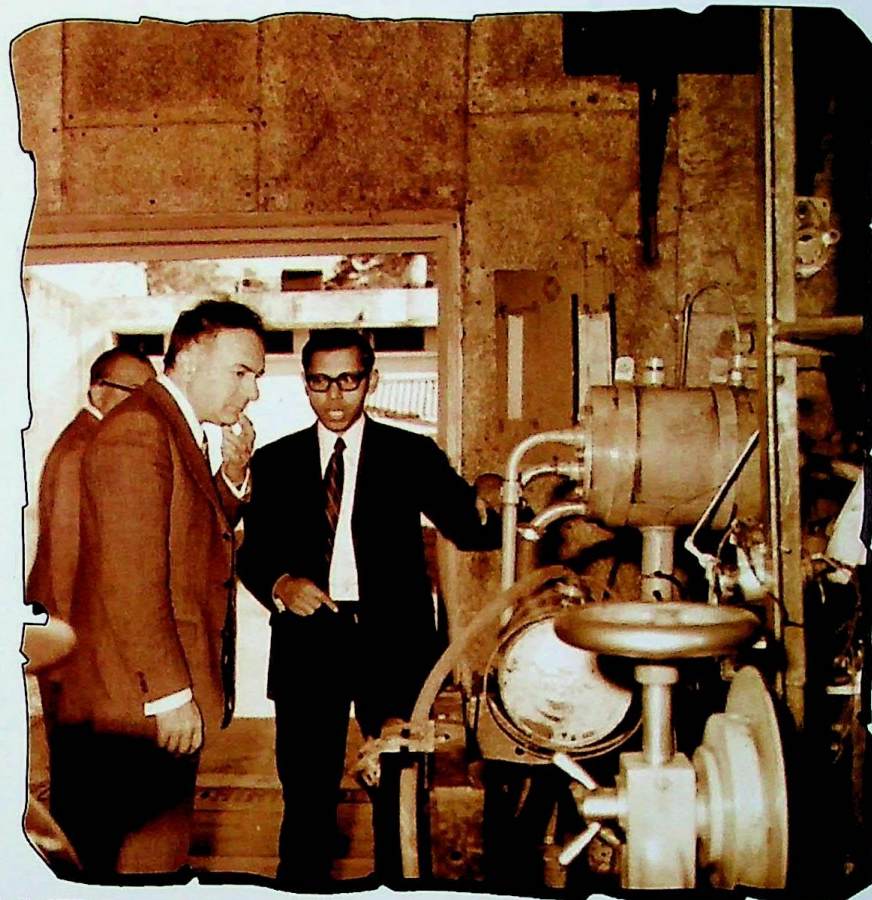
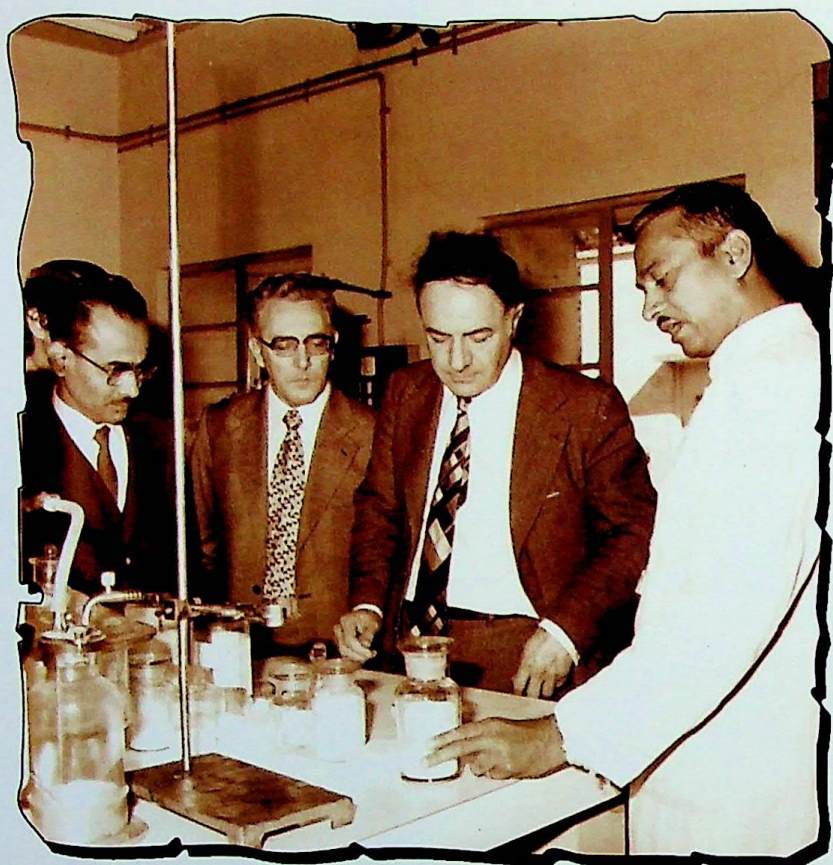
The then Governor of Uttar Pradesh Shri Akbar Ali Khan on a visit to IIP during 1972

Open Day-Science Exhibition for students and general public during early 1970s.

Portable smoke meter developed by IIP

Wide range rotational viscometer developed by IIP

Rotating disc contactor for lube oil studies developed by IIP

Electronic Tachometer developed by IIP

Hydrolic brake fluid test bench developed by IIP

Electronic displacement pump developed by IIP

Cold starting device developed by IIP. A boon for vehicles operating in cold region

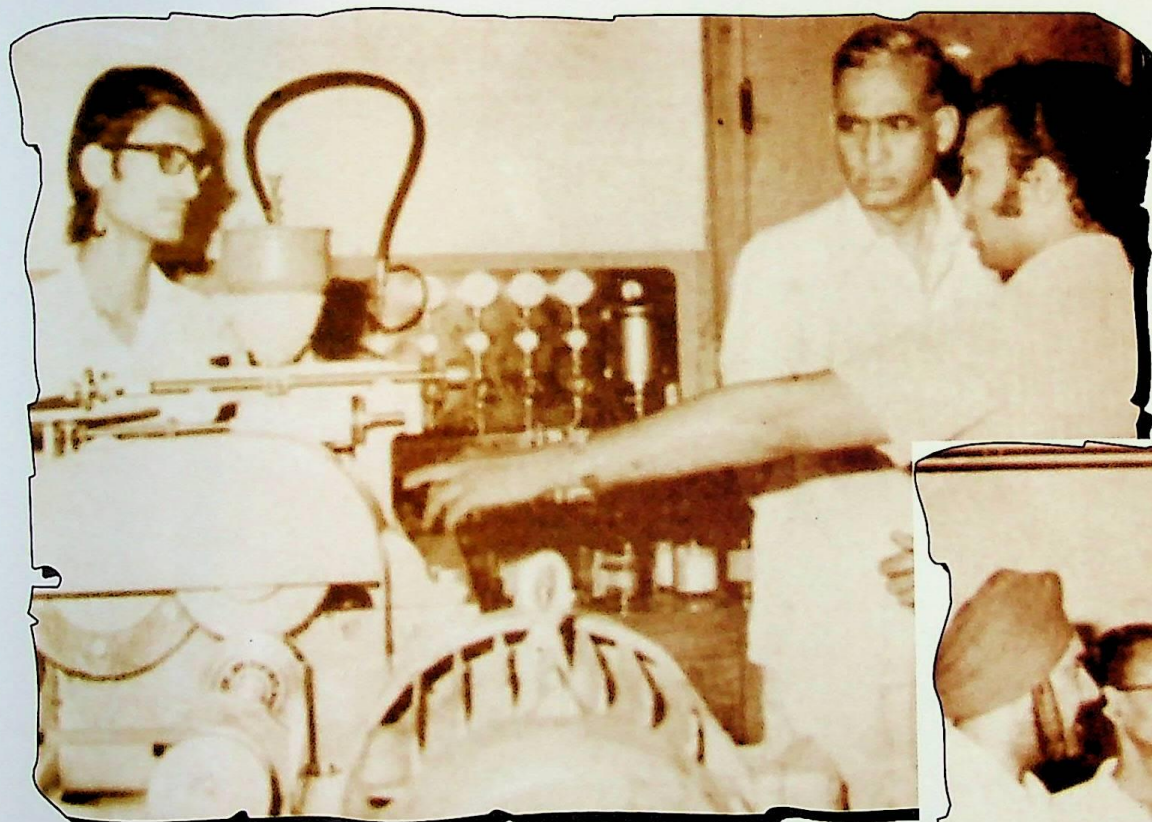
A senior Parliamentarian at a IIP Laboratory

Visit of Parliamentary Consultative Committee in 1973

A delegation from Burma

Visit of Russian scientist during 1973

Foreign scientist's visit IIP during 1973

Visit of Admiral Kohli in 1975

Visit of Mr. B. Soli, IFP France

Many thanks for your kind reception and my Interesting visit to the Indian Institute of Petroleum. I am sure that we will be able to cooperate very efficiently in the fields of common interest for both our Institutes.

B. Soli
I.F.P.
6-12-1974

Prof. Y Nayudamma the then Director General CSIR in the Lubrication Laboratory of IIP

Prof. Y Nayudamma the then Director General CSIR in the Crude Evaluation Laboratory.

"Utilisation of Petroleum Fuels and Lubricants". These courses were considered very prestigious by the industry as admission to candidates was offered only on successfully clearing an all India entrance exam. Each of the three batches accommodated only 10 candidates.

CSIR Management Training Programme during 1974

Period of Opportunities and Growth (1971-80)

By 1973-74, the final year of the Fourth Five Year Plan period the country recognised the increasing vehicular pollution problems and the heightened consciousness of the general public towards it. During the end of 1973 the price hike of imported crude resulted in crude oil crisis. The government quickly seized the economic implications of the rising cost of imported crude which was nearly 67 percent of the country's total requirement. IIP was called upon by the government to examine the various facets of the problem such as improvements in product specification where possible; adopting means to improve the efficiency of petroleum fuel burning appliances; recycling and conservation aspect.

During June 1974 Dr.Krishna was transferred from IIP to Central Fuel Research Institute, Dhanbad as its Director. Dr.Krishna who served the institute from its formation is said to be the main architect of IIP. It was his foresight; zeal and ability which built a strong IIP and made it play a pivotal role in assisting the petroleum sector in the country.

The mandate laid out for the Institute by Dr.Krishna was very ably taken forward without loosing the momentum by another eminent scientist Dr. I. B. Gulati who took over the baton as the third Director of IIP in June 1974. His tenure up to December 1985 was also full of activities.

Dr. Gulati a M.Sc. (Tech.) and Ph.D. had the privilege of being associated with IIP since early 1960's and was well conversant with the expectations of the nation from the Institute. Being a part of the team which implemented the vision and mission laid out for IIP by the government, he got down to work without loosing time and very ably steered the Institute till 1985.

Dr. Gulati's tenure saw IIP fully involved in the R&D programmes tuned to the challenges of the new situation. This period concentrated on adoption and absorption of imported technologies, development of indigenous technologies and products for import substitution. The period also witnessed IIP fully involved in R&D programmes tuned to the challenges of the new situation.

The first major off-shore oil strike - Bombay High by ONGC in 1975 was a land mark in the history of oil development in the country. Being light in nature, low sulphur with high aromatics and wax contents, the Bombay High crude posed difficulty for the Indian refiners to process it as refineries were designed to processing heavy Persian Gulf crude imported from the Middle East. Refinery modifications for processing this light crude were thus needed. IIP was entrusted with all the studies required for the processing of this new crude in the existing refineries.

In many fields the Institute's efforts over the years began to bear fruit in the shape of process and product know-how ready for commercialization. An important event during this period was the commissioning of the 'Kerosene Hydro-desulphurisation Unit' of 557,600 tonnes per year and catalytic Reforming Unit of 190,000 tonnes per year. at Haldia Refinery and Naphtha Hydro-desulphurization Unit of 215,000 tonnes/yr. capacities at Southern Petrochemicals Industries Corp. Tuticorin. The three units were based on processes jointly licensed by IIP and Insitute Francais du Petrole.

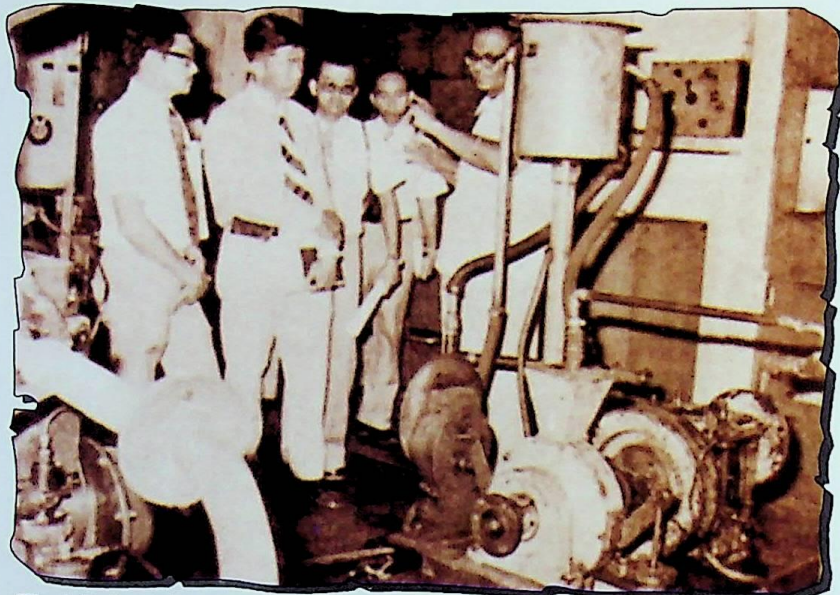
The year also saw the visit of Shri.Keshava Deva Malaviya, the father of Indian oil industry to IIP. Shri.Malaviya made a visit

Father of Indian oil industry visits IIP

I was glad to be here. Saw many good things
K D Malaviya · 21/10/75

Shri Keshava Deva Malaviya visits IIP in October 1975

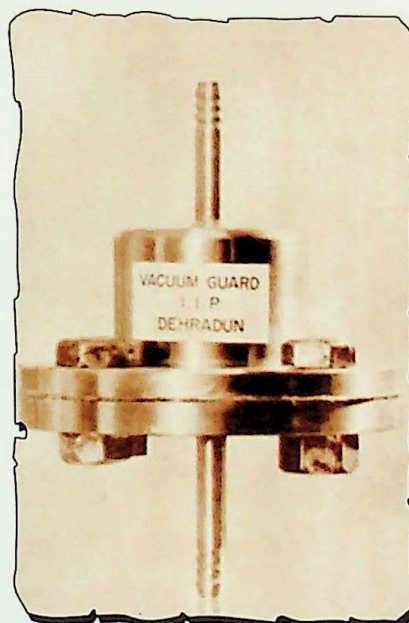
Shri Keshava Deva Malaviya takes keen interest in research work

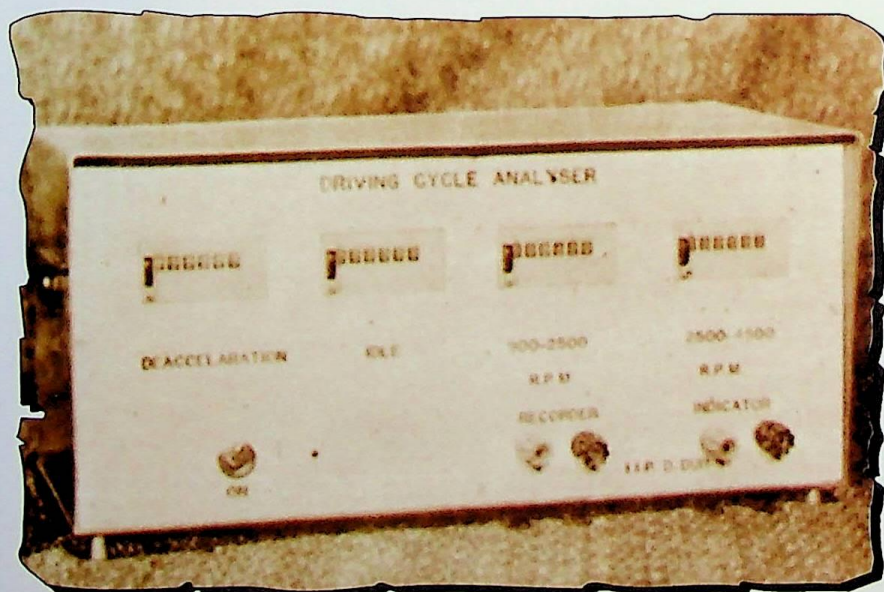
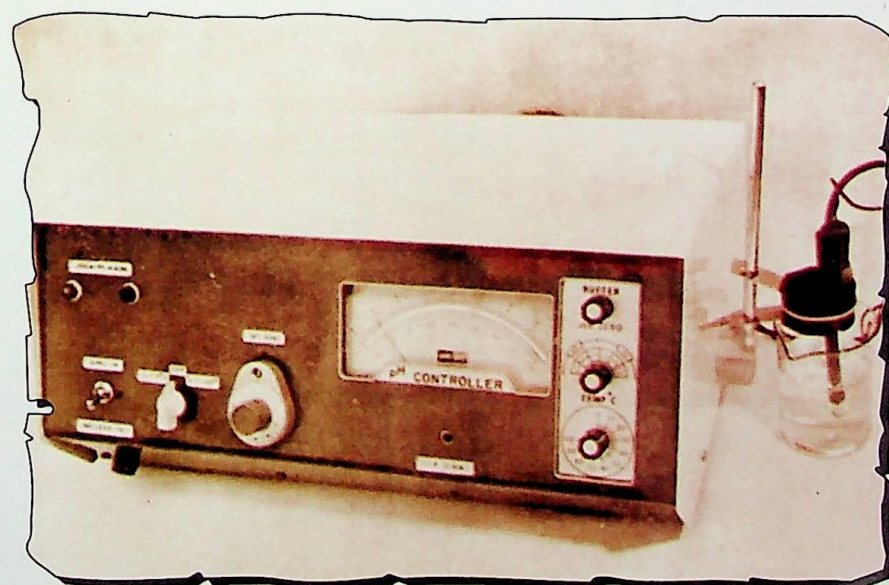
The father of Indian Oil Industry Pandit Keshava Deva Malaviya visit IIP in 1975. IIP was fortunate to have Pandit Malaviya's blessings since its inception.

Thai Delegation on a visit of the Engines Laboratory during 1975

Iraqi Delegation on a visit during 1975

Visit of UNIDO representatives during 1975

UNDP/UNESCO representatives in the Engines Laboratory

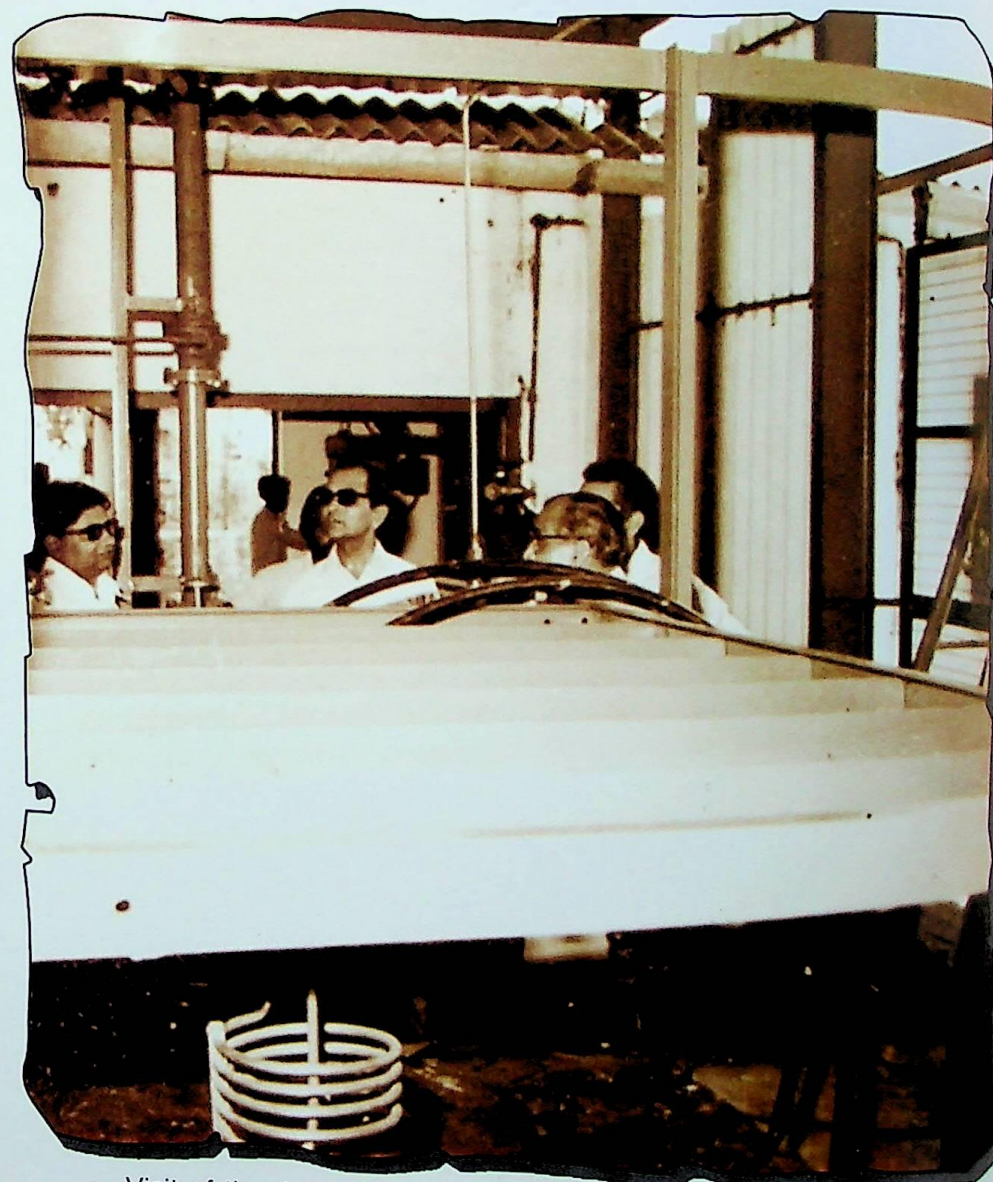
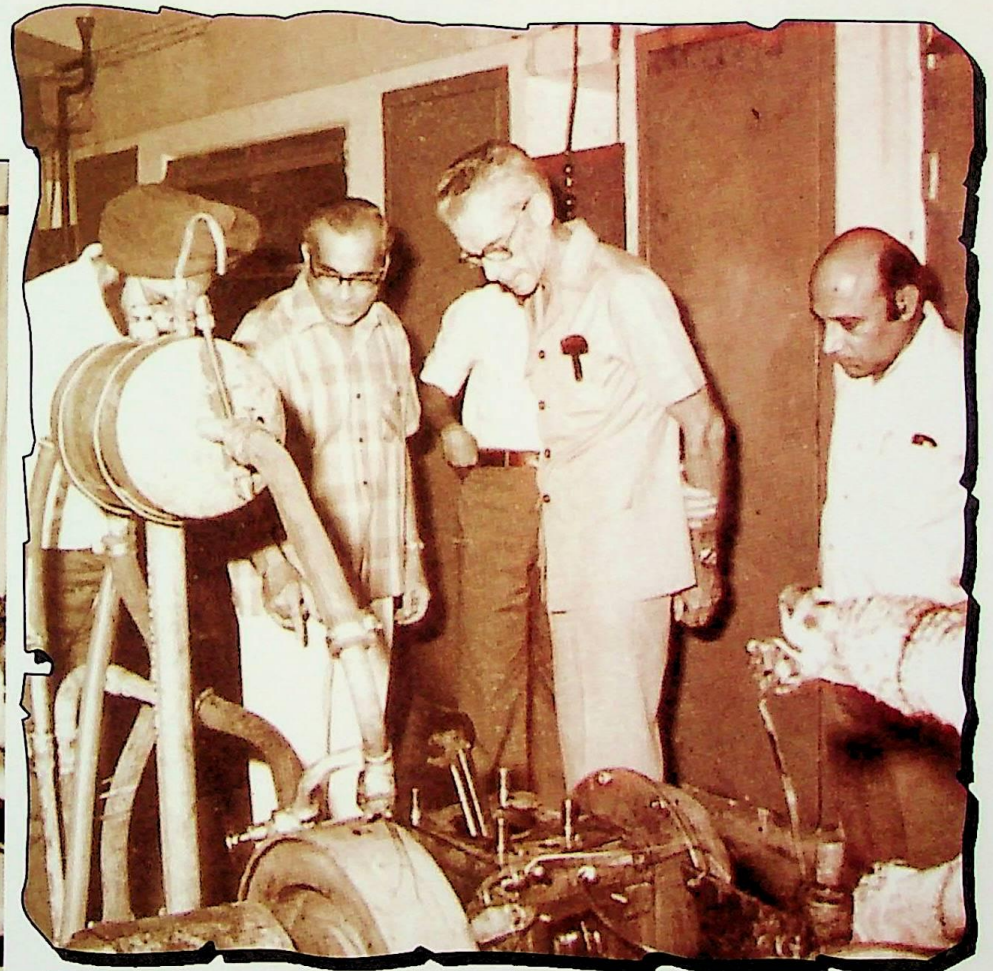
Improved wick stove developed by IIP

Vaccum Guard developed by IIP

Improved wick stove developed by IIP

Driving Cycle Analyser developed by IIP

pH Controller developed by IIP

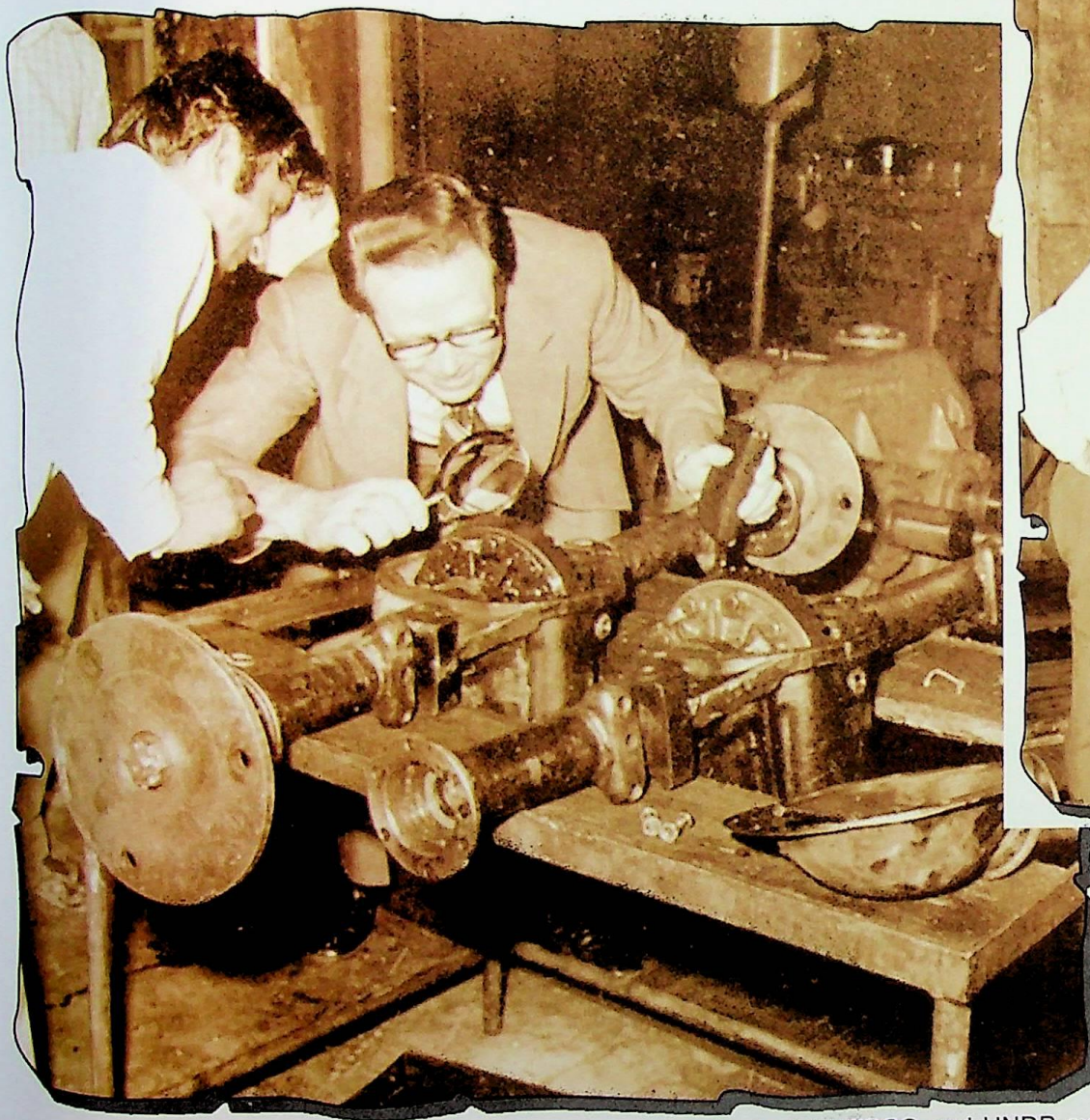
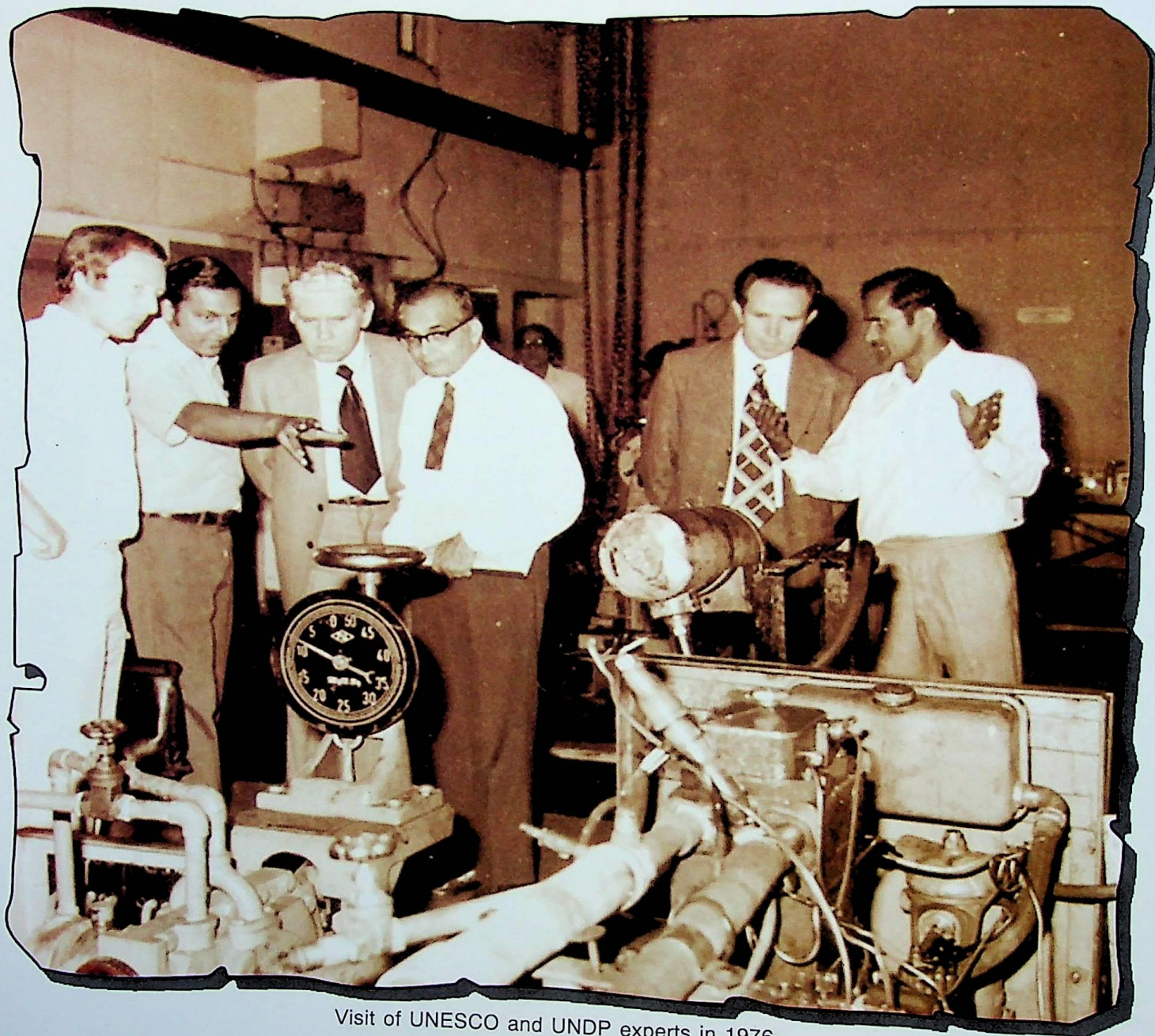
The then Governor of Uttar Pradesh at IIP during 1975

Visiting dignitaries at IIP Laboratory during 1976

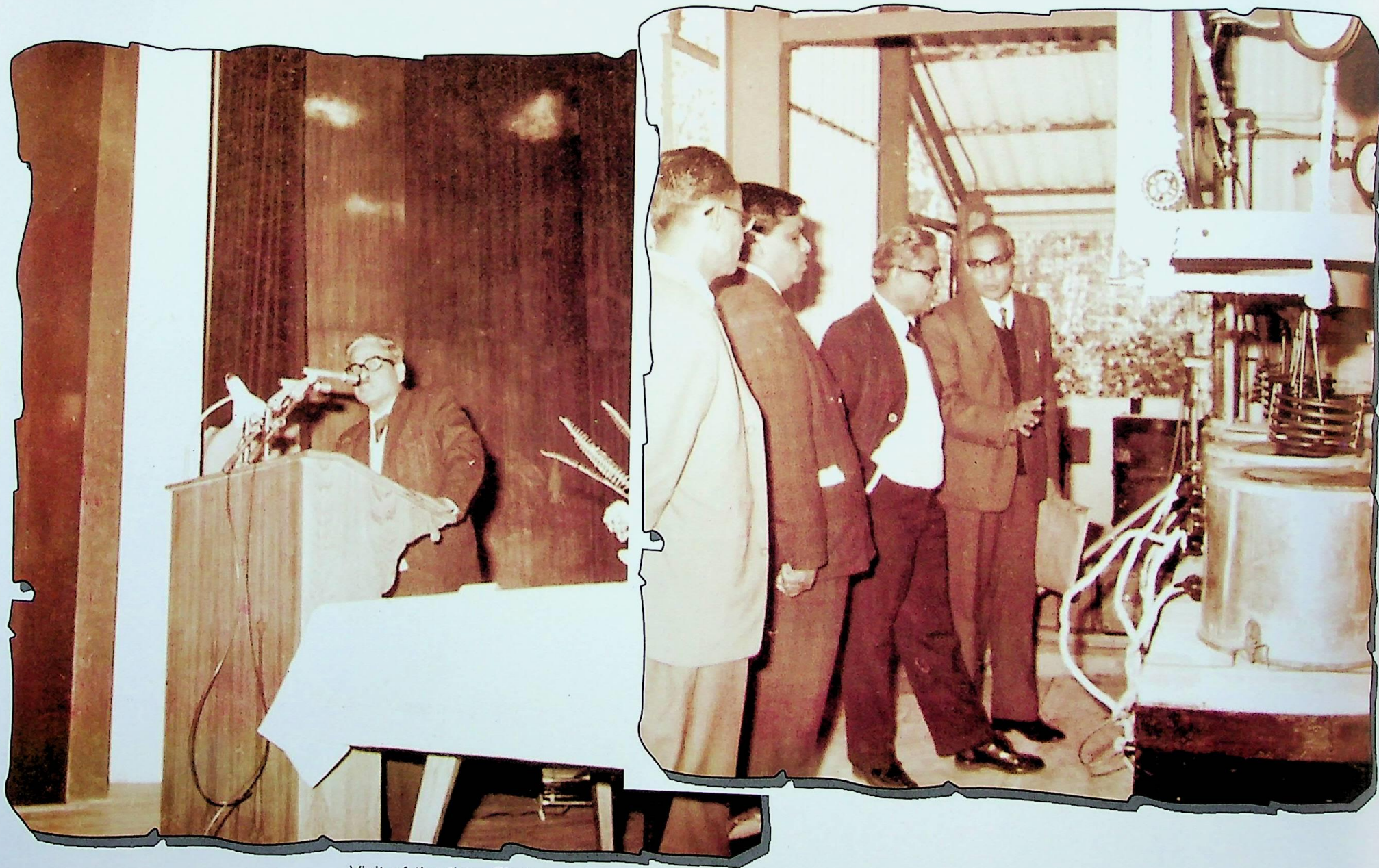
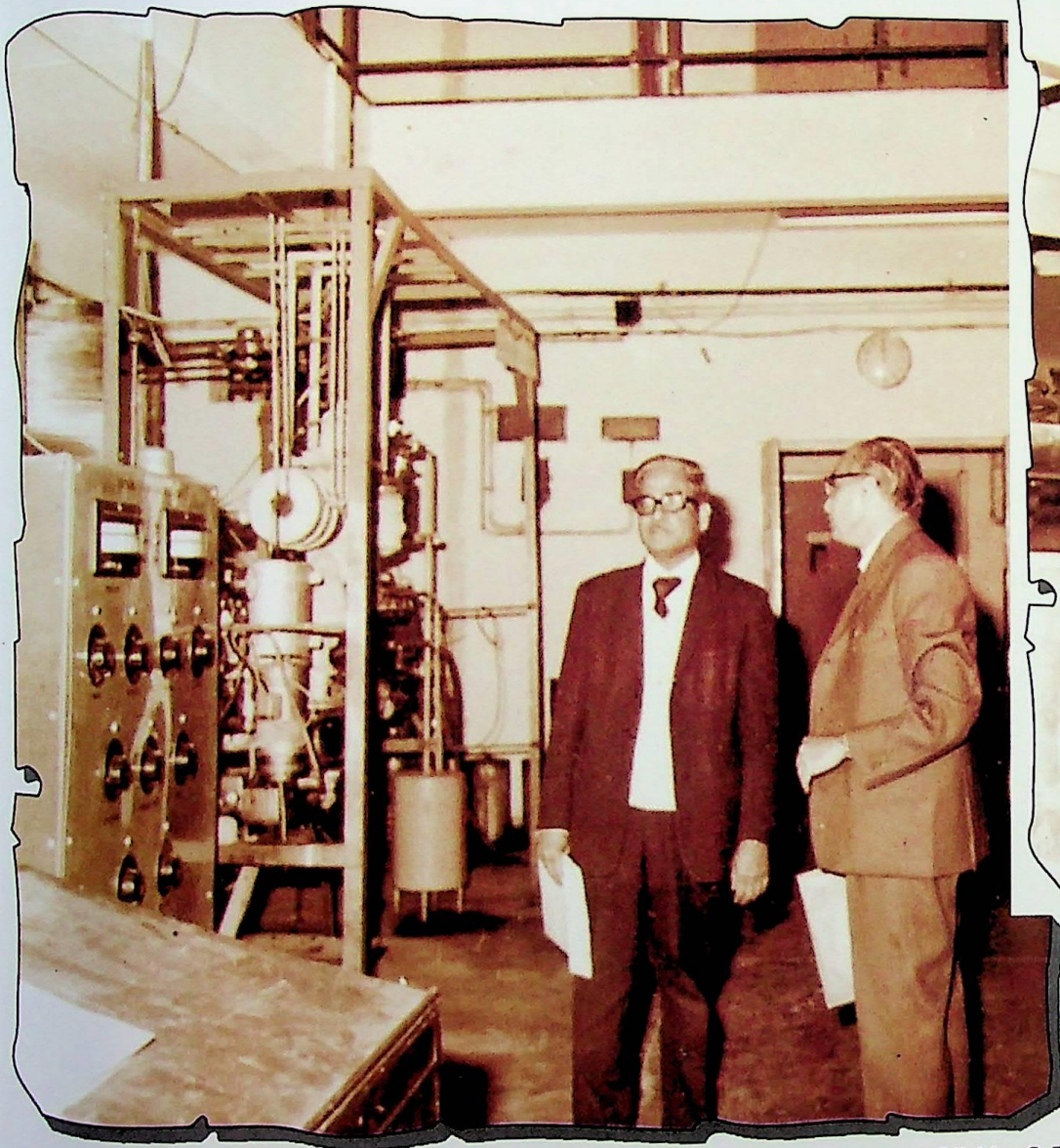
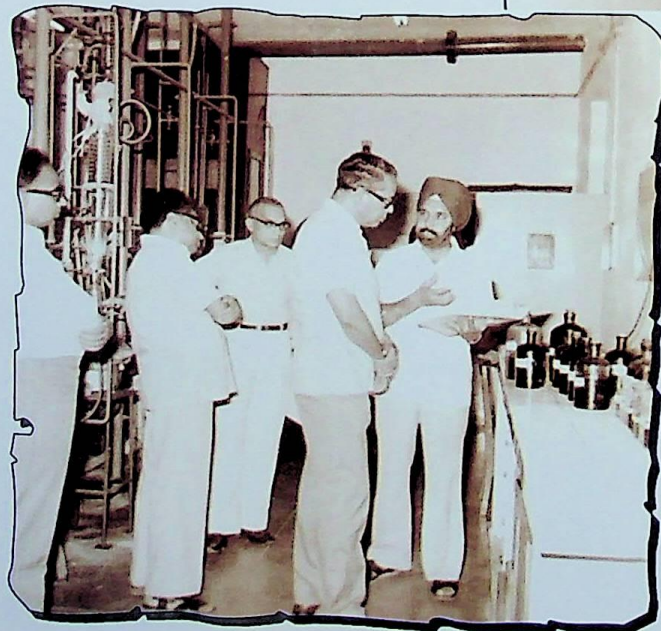
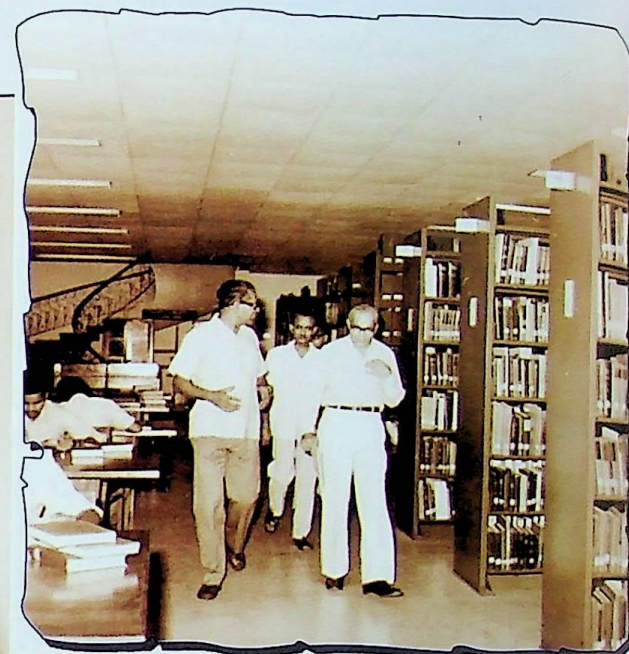
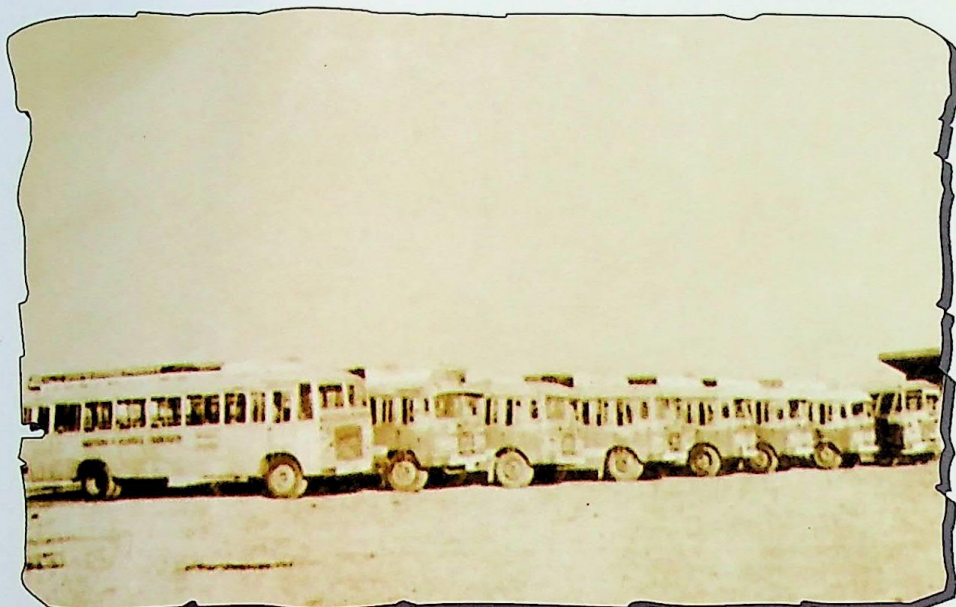
The UNDP team during 1976

The then Minister of Haryana & Transport Commissioner Haryana visit during 1976

Visit of the then Chairman, Indian Oil Refineries during 1976

Visit of the then Chief EN-ESCAP, Mr. A.I. Cutehen during 1976

Visit of the then Chairman, Indian Oil Refineries during 1976

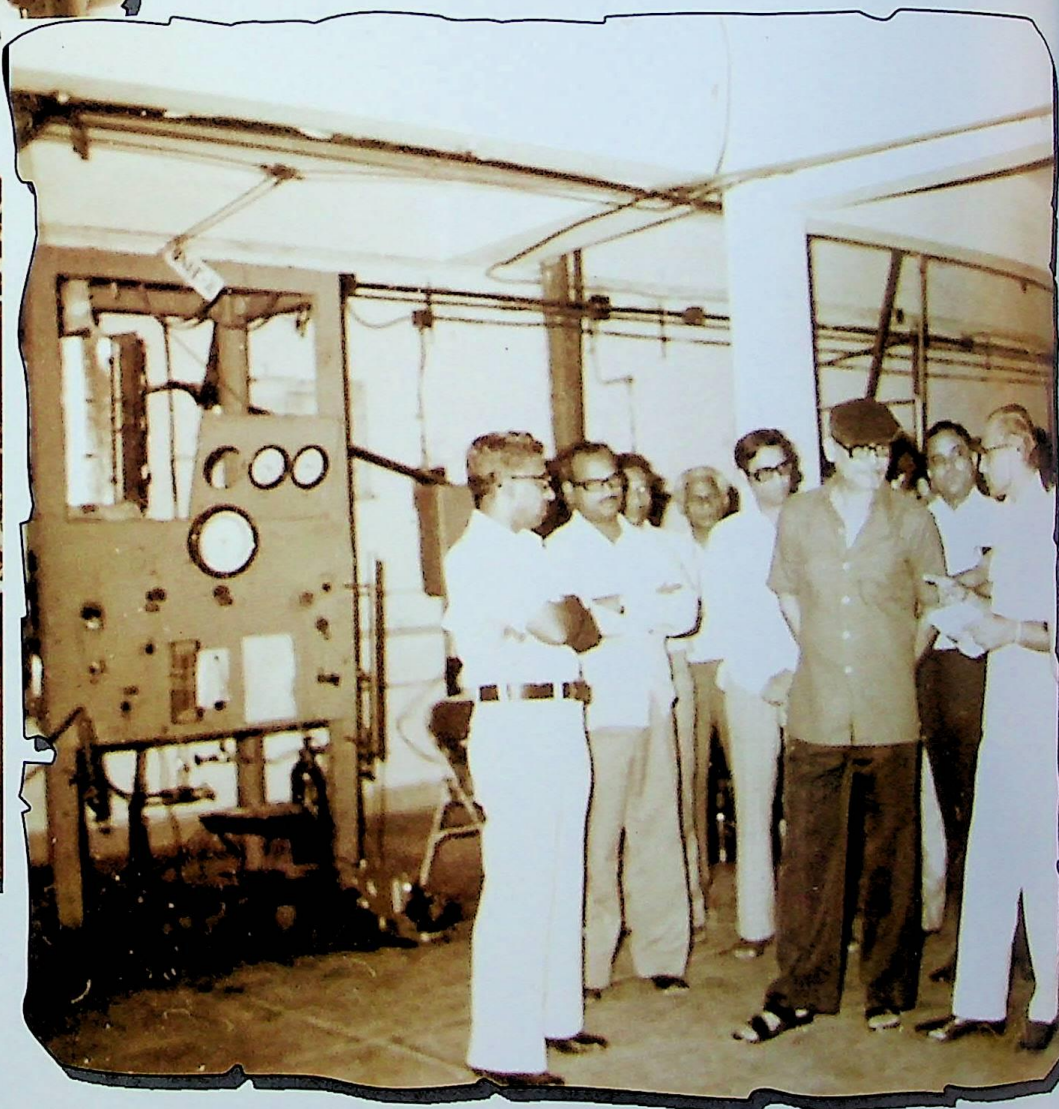
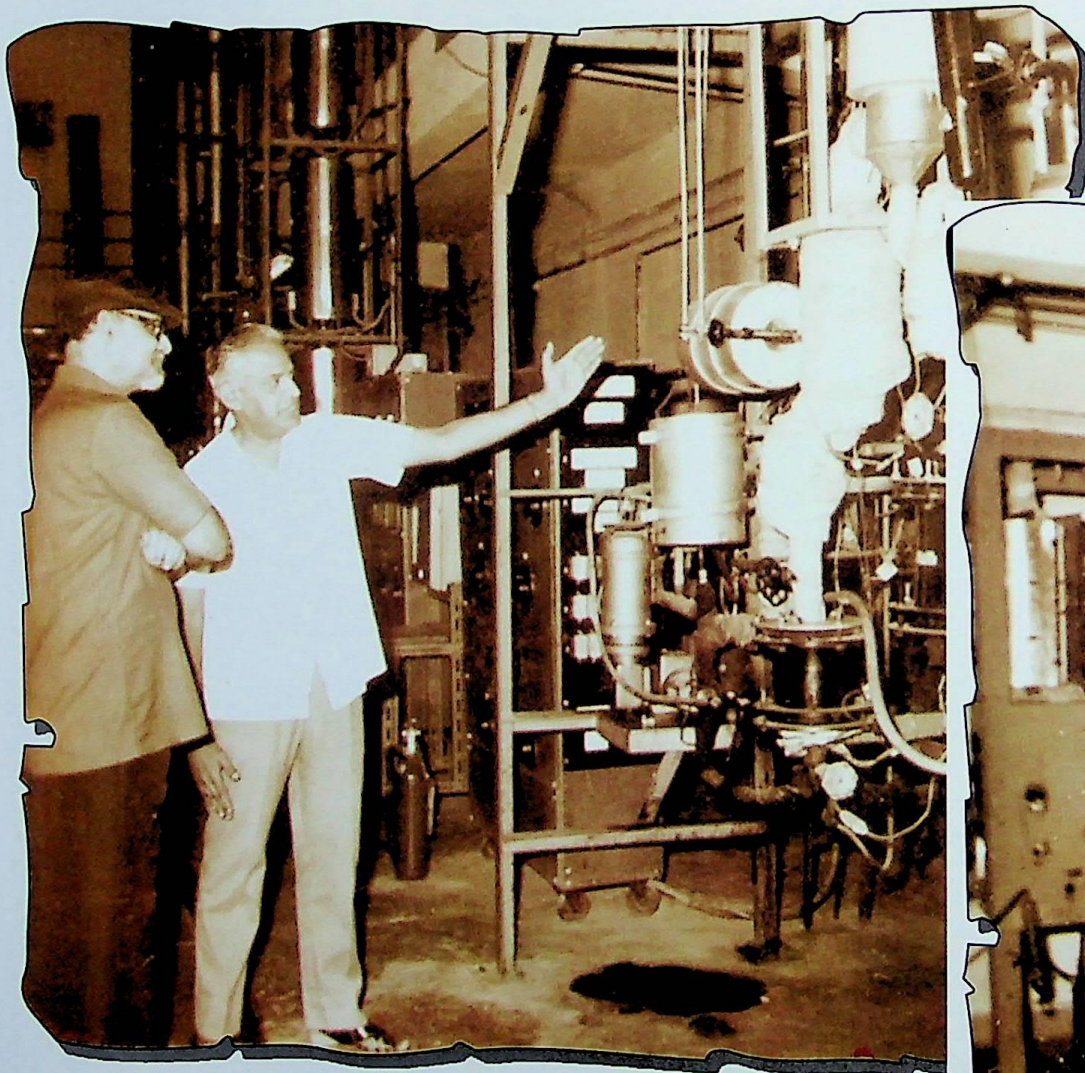
Visit of Delegation from Thailand during 1976

Visit of UNESCO and UNDP experts in 1976

Visit of UNESCO and UNDP experts in 1976

Visit of Romanian delegation during 1977

Visit of the then Chairman, Indian Oil Mr. C.R. Dasgupta speaking during 1977

Visit of the then Chairman, Indian Oil Mr. C.R. Dasgupta speaking during 1977

Visit of the then Secretary, Ministry of Petroleum Shri B.B. Vohra during 1977

Field trials on Haryana Roadways buses on the suitability of re-fined crankcase oils.

Engineers of Haryana Roadways undergo training during 1977

Participants of course on Administration Management during 1977

Participants of Refinery Association during 1977

Visit of the then Chief Executive Indian Oil Corporation Limited Mr. Sinha during 1977

Visit of the then Tanzenian Minister Mr. Bango during 1977

Visit of the then Tanzenian Minister Mr. Bango during 1977

to the different laboratories of the Institute and interacted with the scientists.

During the year 1976 the petroleum refining industry underwent a landmark change due to the nationalization of the erstwhile Esso Refining Co., the Burmah-Shell Refinery and the Caltex Oil Co. IIP endeavoured to establish active linkages with these newly nationalized refining and marketing companies to play an effective role in meeting the R&D, products, services and the training needs of the re-structured oil industry.

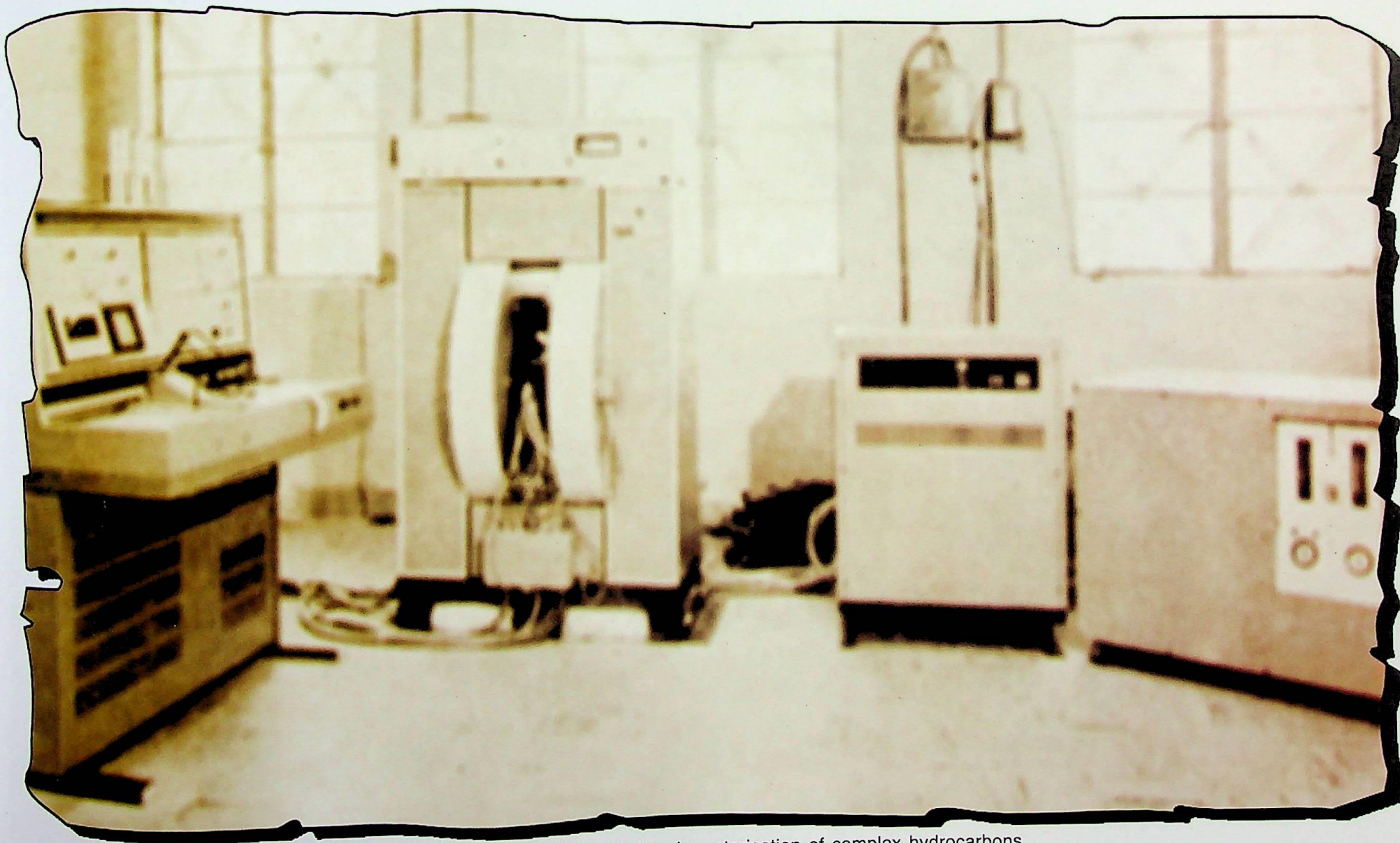
Besides this, IIP continued to carry out extensive work on different aspects of refining the Bombay High crude.

The work of the Institute during the year 1977 was further oriented to meet the demands of the difficult and changing oil situation. The programmes related to conservation and efficient utilization of petroleum products received greater attention and gathered momentum. Important amongst these were the projects on "Utilization of Methanol", "Use of biogas in stationary I. C. Engines" and studies on extending the engine-oil drain interval.

Successful attempts were made by the institute in attracting greater involvement of industry in its work by way of sponsored investigations. Noteworthy amongst these are the projects sponsored by Scooters India Ltd., Gujarat State Fertilizer Corporation, Bharat Petroleum Corporation Limited, Madras Refineries Limited and Cochin Refineries Limited.

M/s Percynic Chemicals Ltd. were licensed the know-how for manufacturing para-tertiary butyl phenol, an anti-oxidant additive.

During September 1977, Shri. Hemvati Nandan Bahuguna, India's top politician of those days visited IIP.

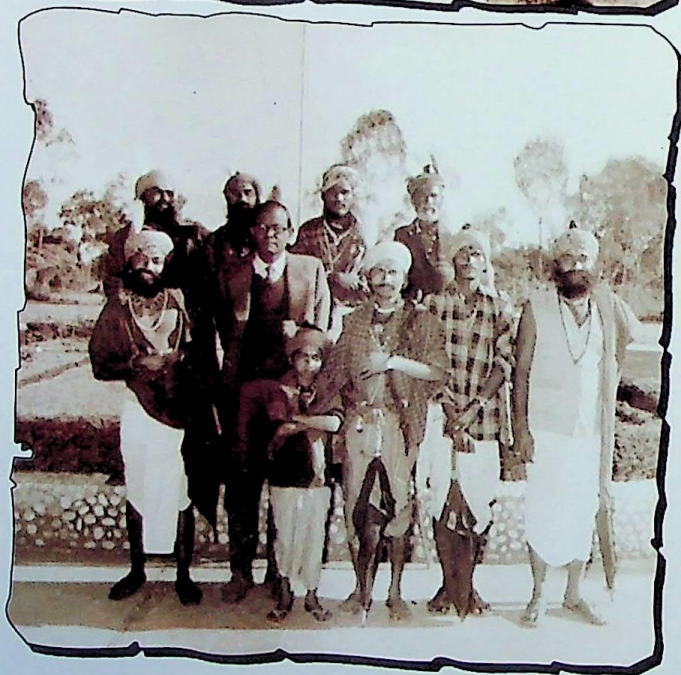
In 1978 the Institute was aggressively involved in the

JEOL (Fx-100) NMR unit for characterisation of complex hydrocarbons

Visit of the then Minister for Petroleum and Natural Gas, Shri Hemwati Nandan Bahuguna on a visit during 1977

Human race for long and continues to master nature.
Resurgent India is in this race once more.
This institution is the Catalyser of this Effort.
My good wishes

[illegible signature]
20/7/77

Visit of the then Minister for Petroleum and Natural Gas, Shri Hemwati Nandan Bahuguna on a visit during 1977

The Chief and his tribes men from tribal area Bastar visits IIP in 1978 to have a feel of Science and Technology

The Chief and his tribes men from tribal area Bastar visits IIP in 1978 to have a feel of Science and Technology

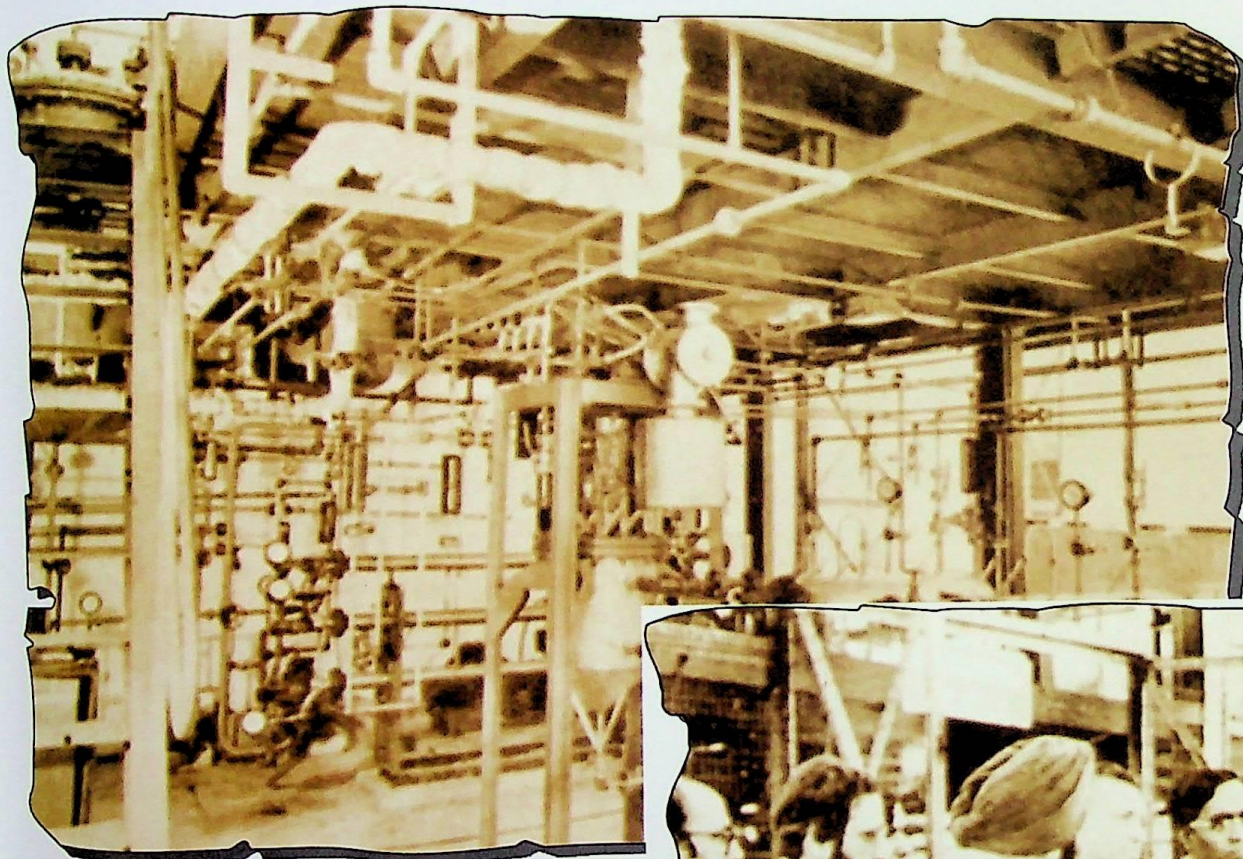
The Chief at the IIP tea garden

Visit of the then Vice President, Iraq Mr. Al-Hadi and Ali Jabir in 1978

Visit of T.S. Nair the then Minister of Petroleum in 1978

Visit of Shri K.V. Raghavan, the then Chairman, Engineers India Limited in 1978

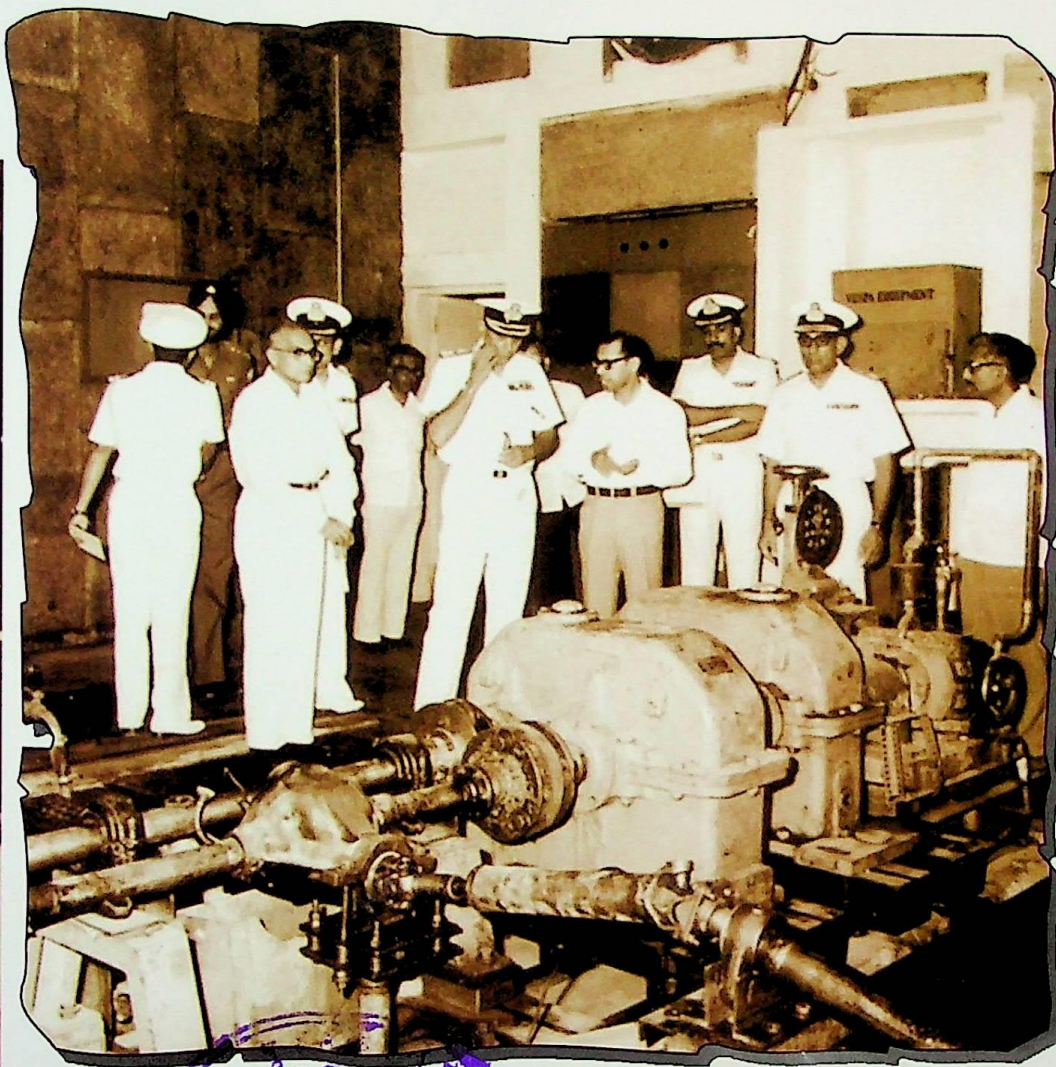
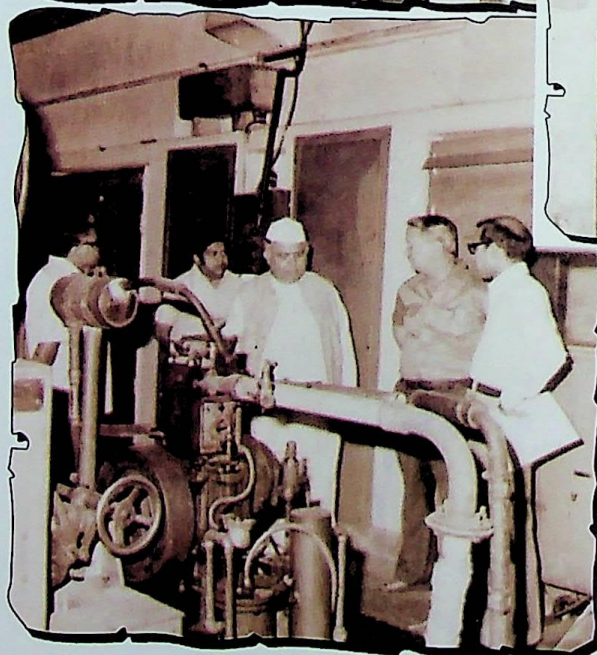
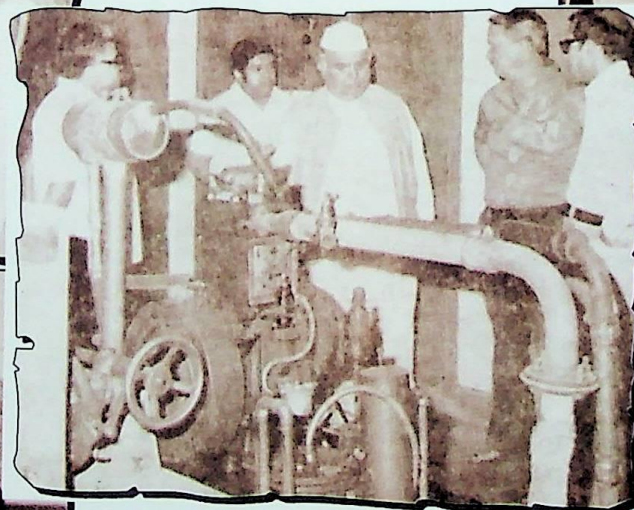
Visit of Oil Industry expert

Wax deoiling pilot plant under construction

Mr. K. V. Raghavan, the then Chairman and Managing Director along with Dr. R. Krishnamurthy, the then Manager (Processes) and Dr. P.K. Mukhopadhyay the then Manager (R&D), Engineers India Ltd. holding discussions with the then Director and other members of IIP at the wax deoiling pilot plant site at Dehradun.

Visit of UNDP team

UNDP Review team visting IIP laboratories. Seen in the picture are (L to R): Mr. V.G. Podoinitsin, the then Director and Chief of Mission, UNESCO, Dr. V. A. Zvonow, the then Chief Technical Advisor on UNDP

The winners of IIP Football Team of the yester years. IIP Football team was considered amongs the best in the Dehradun District during 1970s

The bird's eye view of IIP Campus as photographed in late 1970s.

Visit of the then Chief of Naval Staff, Admiral R.L. Pereira during 1979

Visit of Prof. Nurul Hassan the then Vice President, CSIR during 1979

Euphorbia tirucalli linn, a possible future petro-crop under trial at IIP

Vehicles under going Field Trials on Alcohol-Gasoline Blends as fuel (in collaboration with IOC, R&D Centre, Faridabad)

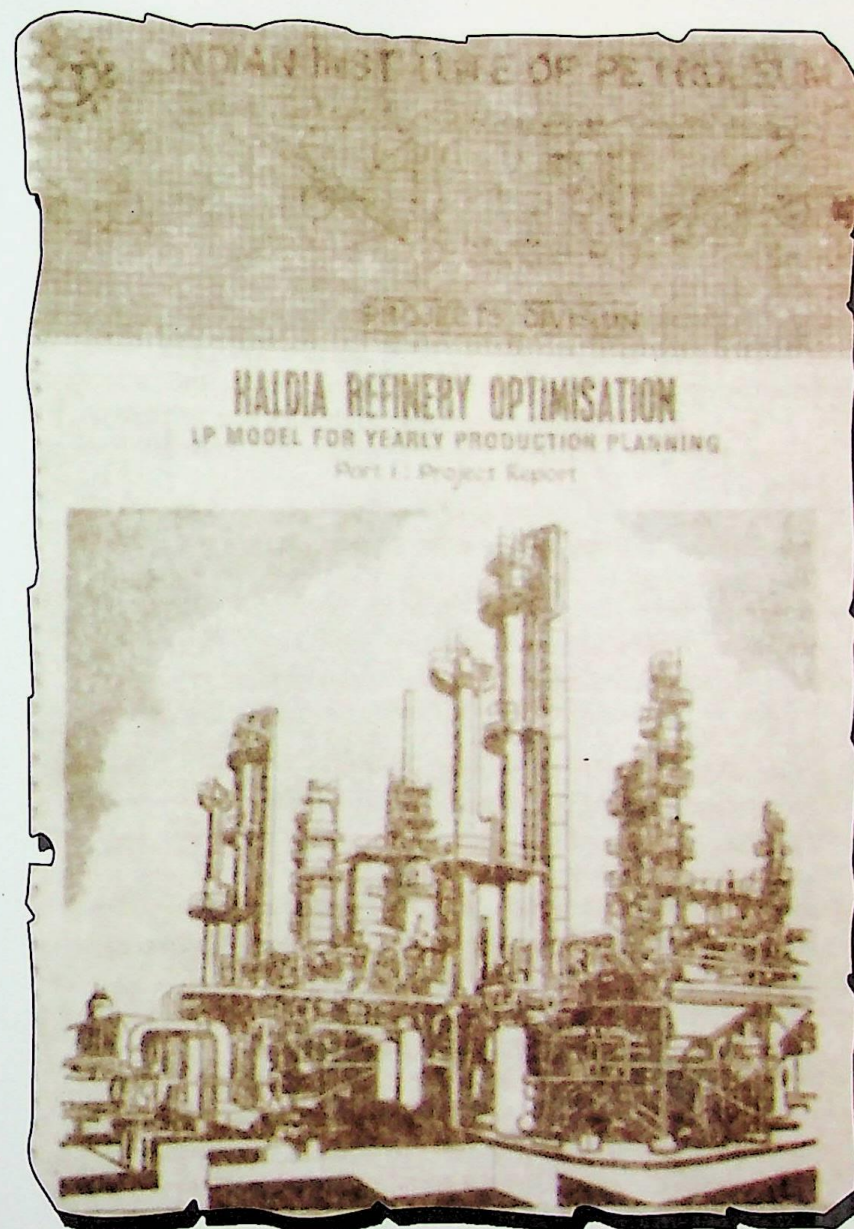
Fifth wheel set-up for studies on fuel economy and simulation of urban driving cycle deviced by IIP

Discussion in progress at the "Workshop on Criteria for Change of Engine Oil"

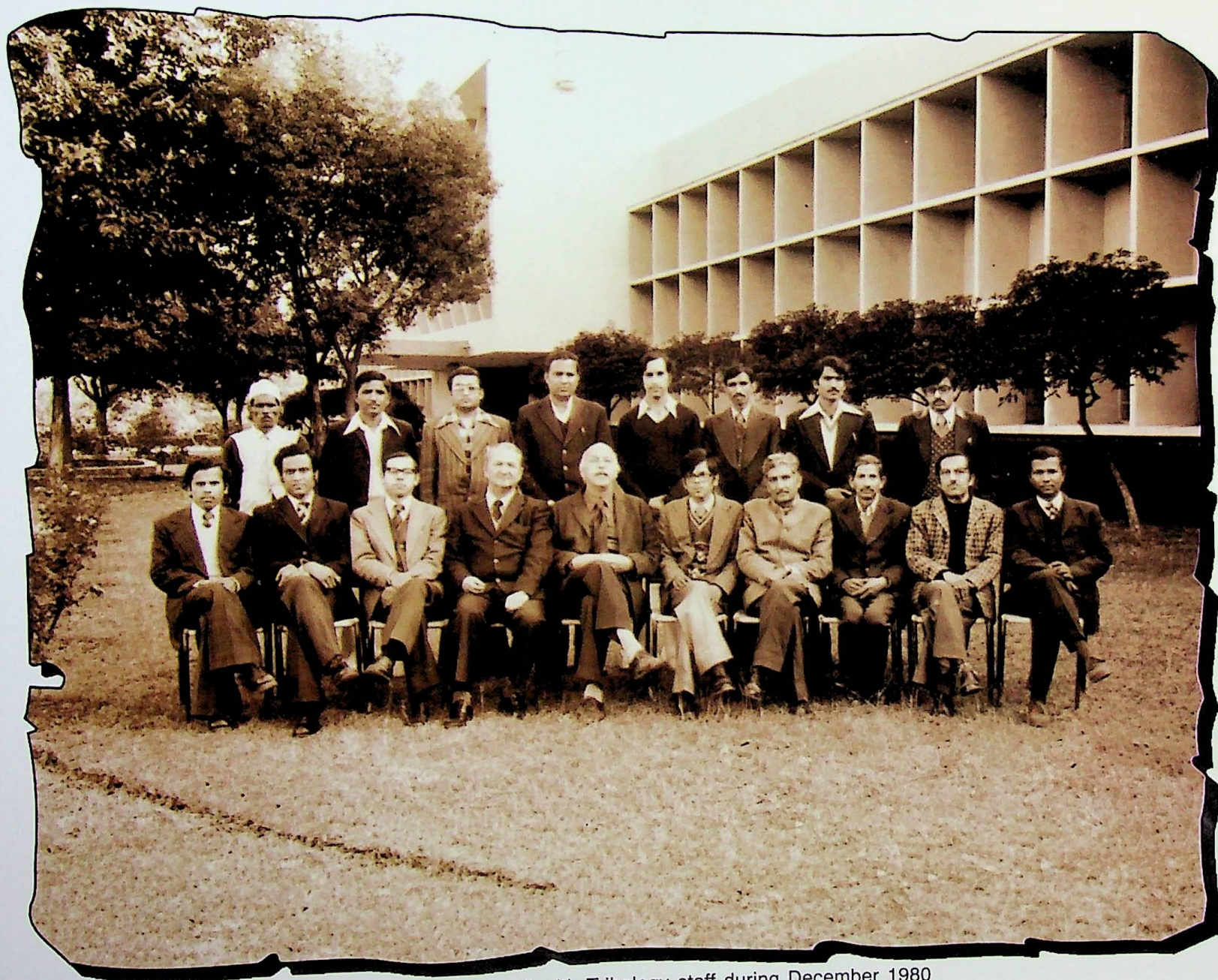
Shri R. N. Bhatnagar, the then Chairman & MD, Bharat Petroleum Corporation delivering the inaugural address on the Second One Year Training Course

HALDIA REFINERY OPTIMISATION

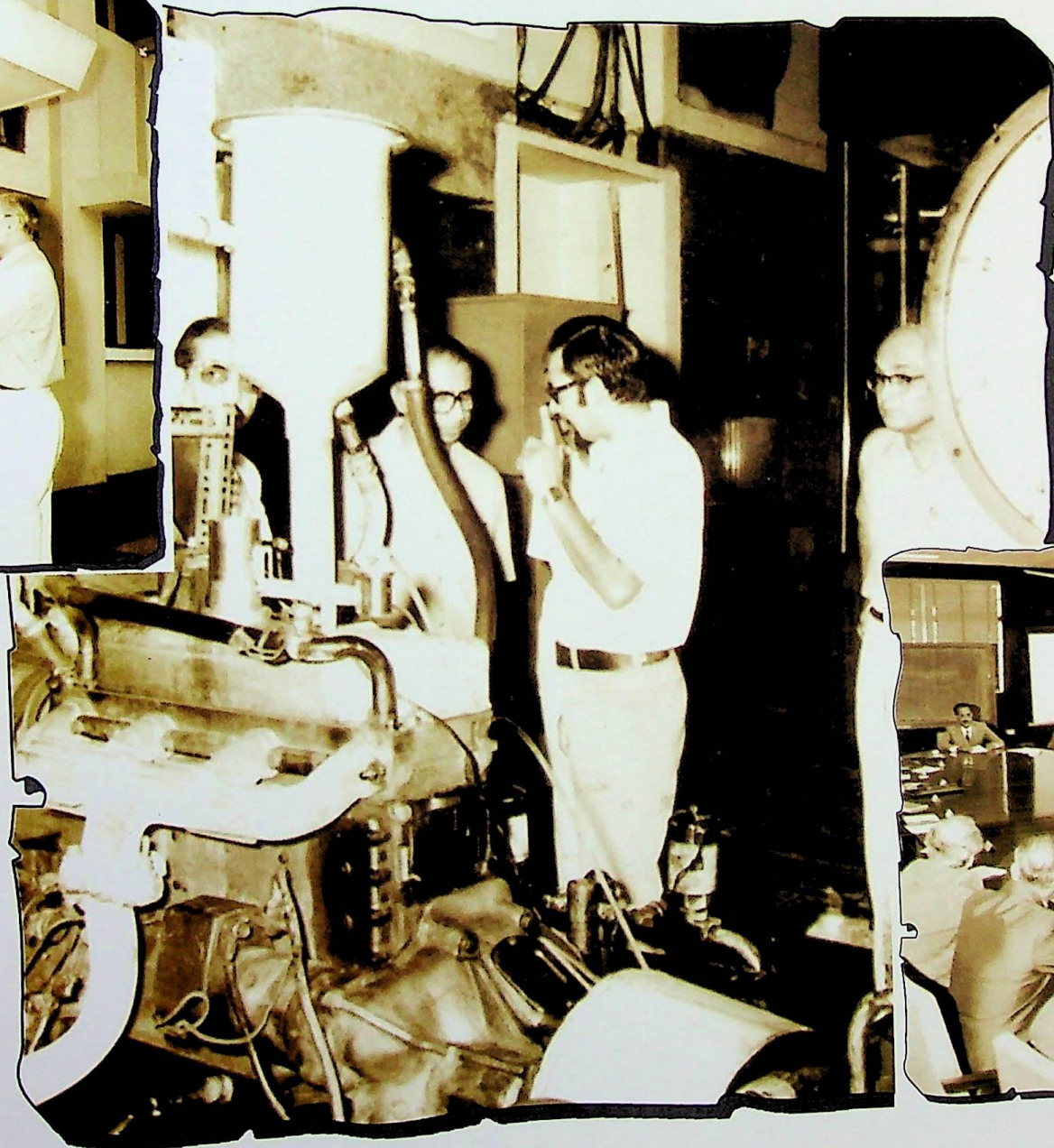
LP MODEL FOR YEARLY PRODUCTION PLANNING

Part I: Project Report

A report on production planning optimisation prepared by the Projects Division, IIP for Haldia Refinery study sponsored by Indian Oil Corporation

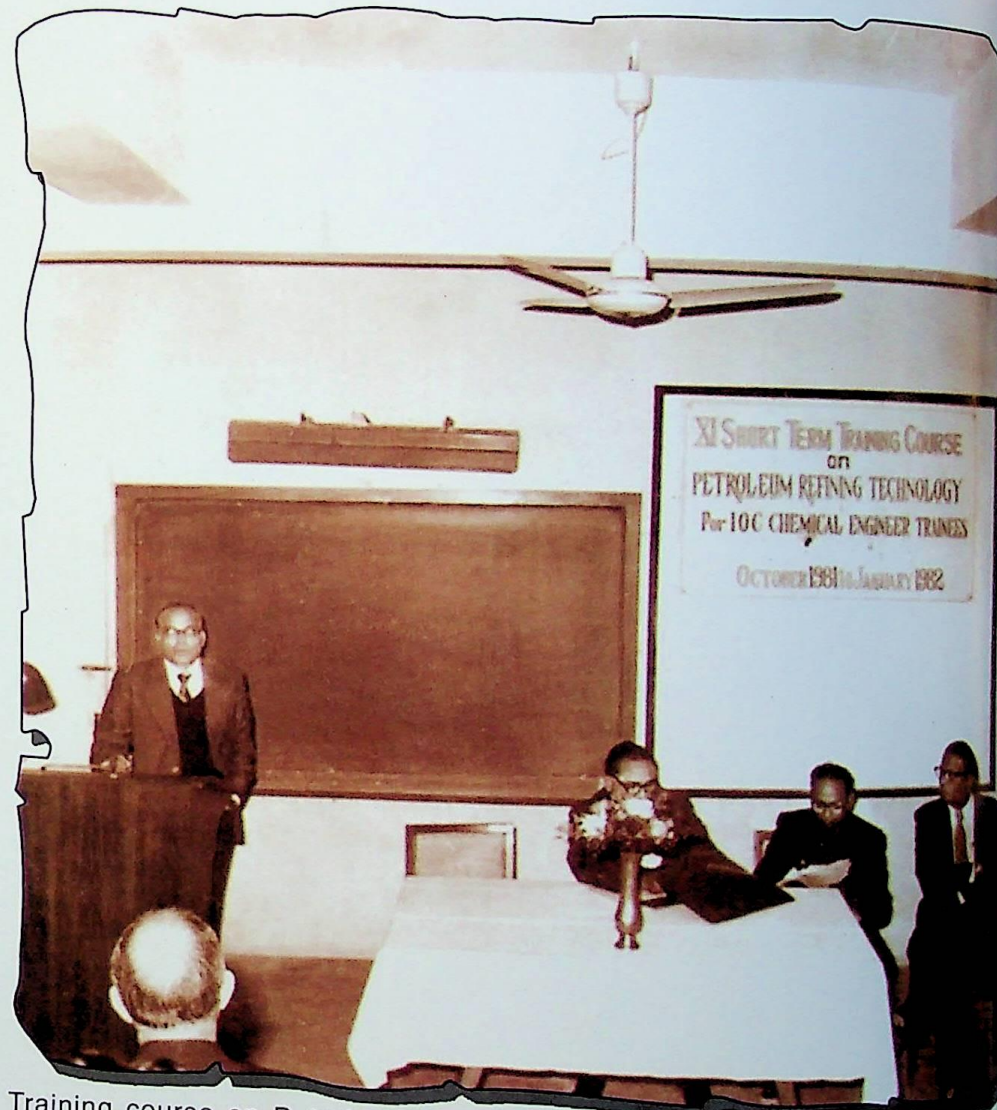
Visit of Paul Stingare Kasenger of ASTM during 1980

Phot of Dr. Darwell while delivering the lecture during December 1980

Group of Dr. Barwell with Tribology staff during December 1980

Road trials on Institute's own truck using methanol-diesel blends during early 1980s

Visit by eminent defence and industry experts

IIP experts discuss on 'vehicle fuel economy

Farewell of Dr. Znonov in November 1981

Visit of a group of Romanian experts in early 1982

Training course on Petroleum Refining Technology for IOC Trainee Chemical Engineers during 1981-82.

(Left): Visit of the then Chief Secretary, Government of Uttar Pradesh in 1982

(Top): The then Chief Secretary, Government of Uttar Pradesh along with his wife at the IIP tea garden

development of catalysts as the catalysts employed in the refineries were all imported those days.

For this purpose new bulk preparation facilities for catalysts were created. On the development side, the work on bimetallic reforming catalysts was intensified. The Institute's engineers carried out the regeneration of the Reformer Catalyst at the Haldia Refinery.

Other important activities in the area of refinery processes related to the development of solvent extraction processes for extraction of aromatics and LPG sweetening process. For aromatic extraction a comprehensive study comprising of generation of large amount of LLE and mass transfer data was carried out in collaboration with the R&D Division of Engineers India Limited. The Institute continued to provide assistance to refineries in product and process evaluation. Studies on production of micro-crystalline wax from bright stock was done for Madras and Haldia refineries.

The work on product application, related to efficient utilisation of fuels in engines was oriented to basic understanding of the combustion phenomenon through mathematical modelling to provide a sound approach for achieving improvements.

With the object of finding alternate sources of hydrocarbons over a long-term basis, exploratory study was done on the composition of the sap from 'Euphorbia Triculli' series of plants.

The Institute procured and installed a Carbon-13 Nuclear Magnetic Resonance (NMR) Spectometer to augment the Institute's capability for hydrocarbon structural analysis work.

The Phase II of the UNDP Assistance Programme commenced in 1978. The Institute which had a UNDP aid programme running in the area of Application of Petroleum Products, on its successful completion was re-considered for an extension by the UNDP and Government of India with additional inputs to the tune of 0.72 million dollars, raising the total grant from 1.2 to 1.9 million dollars. This assistance greatly strengthened the Institute's expertise in the area of two-stroke engine, industrial burners and applied computer techniques for refinery process optimisation. The major equipments received under this aid included: Scanning Electron Microsscope, Beckman Exhaust Gas Analyser, Schenk Dynamometer, DIGITAP Engine Cycle Calculation System, Jerral Ash Gas Chromatograph, HP Gas Chromatograph etc.

During the year 1979 a comprehensive report 'Bombay High Crude Handbook' was prepared which served the basic data needs of all refineries processing Bombay High crude.

Extensive work was carried out on Ethanol-gasoline blends for engines; this included field trials on vehicles of different makes. The institute suggested that the application of such blends in all makes of Indian passenger cars was feasible with some minor modifications. Work undertaken included in-depth studies of combustion phenomena, new fuel Induction systems and charge stratification. These studies established the feasibility of using gasoline-alcohol blends containing up to 20% alcohol in the various models of Indian cars. Basic combustion studies on two-stroke engines were also initiated with a view to improve their fuel economy.

Low air pressure medium capacity burners which formed the bulk of industrial burners used in the country were developed. Under sponsorship of Petroleum Conservation Research Association (PCRA), a study of the performance and efficiency of the three major existing makes of those days was initiated with a view to develop better designs, particularly for use on heavy grade furnace oil.

The Tribology Laboratory of the Institute was strengthened. The Laboratory had successfully developed shock-load test technique to evaluate Hypoid rear axle oil and lab test technique to

evaluate scuffing characteristics of 2-stroke engine oil.

The 1980 saw the thrust on indigenous development of processes and catalysts for use in refineries and on technologies for efficient utilisation and conservation of petroleum products.

There were specific plans to establish new industrial units in the country for the manufacture of aromatics and waxes. In keeping with these goals, during the year efforts were intensified for commercializing processes for extraction of pure aromatics and for manufacture of waxes. Working in collaboration with the Engineers India Limited a substantial progress was made; erection of dewaxing pilot plant at IIP was completed and after some initial teething problems trial runs were undertaken.

In the application of petroleum products, efforts were oriented in two specific directions, i.e on studies aimed at improving the efficiency of utilization of fuels and lubricants, and investigation on use of alternate fuels, particularly alcohols.

The Institute continued to provide technical assistance to the industry in problems faced due to changes in the type of crudes available to refineries. This work included study of processing of new crudes and product slate optimization. The production planning program for monthly production was developed for Haldia refinery in continuation of the earlier work for yearly planning. On behalf of the Ministry of Petroleum revised and updated report for demand forecast was prepared containing "Demand Projection for Petroleum Products 1980-81 to 1989-90".

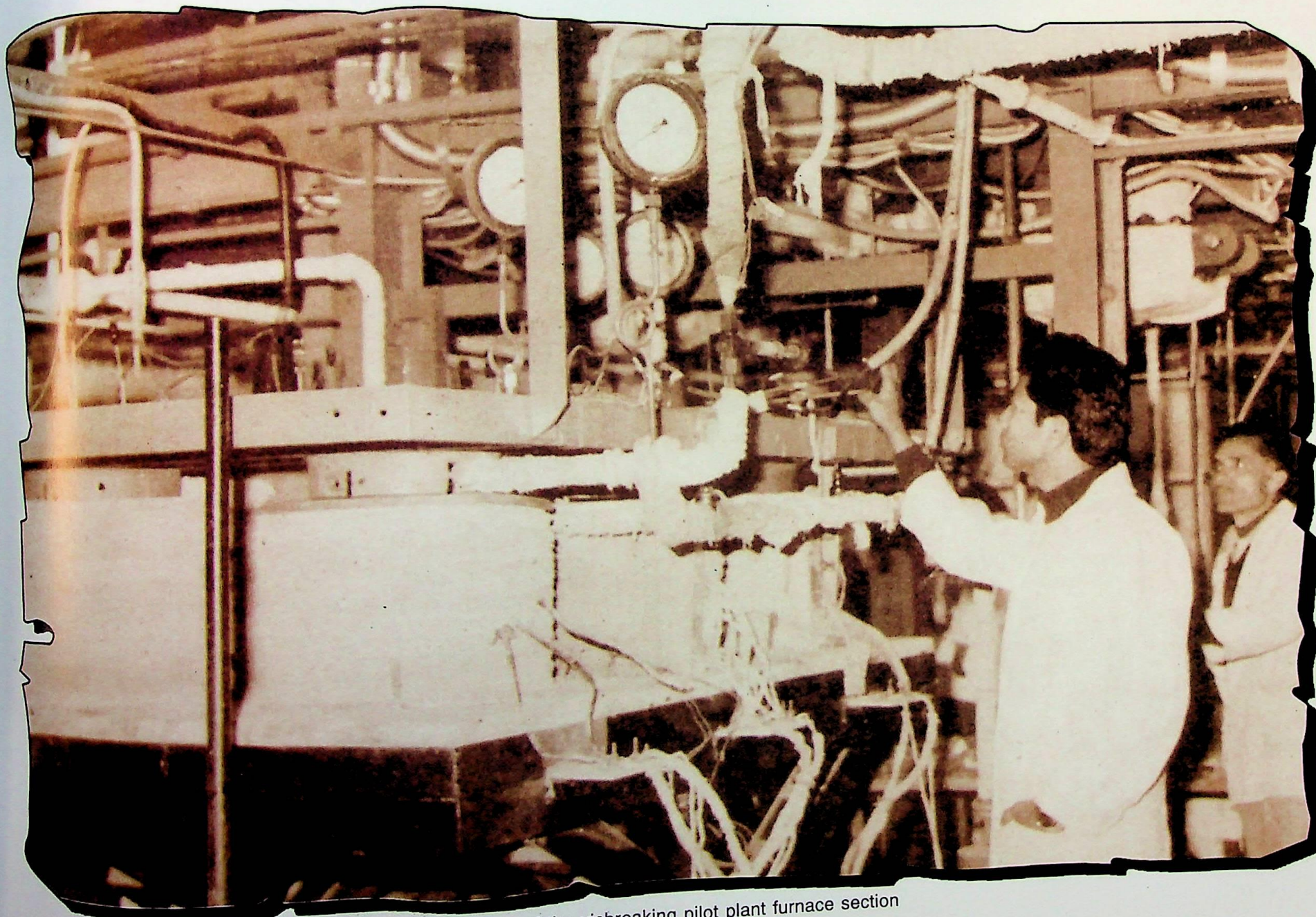
The era of lab to industry (1980-1990)

The years beyond 1981 saw a significant shift of the institute's activities beyond the laboratories. The institute got oriented towards the industry requirements. This increase of interaction with the industry enabled the institute to achieve technology transfers.

Visit ot Tanzanian delegation led by H. E. Mr. A L Noor Kasuru, the then Minister for Water & Energy, Tanzania in 1983.

After years of continuous work at the laboratory and at Bench Scale Units, the Institute, along with Engineers India Limited, was able to offer complete process for the new aromatic extraction unit of Bharat Petroleum Corporation. The unit had a capacity of 106,000 tonnes of Benzene and Toluene per annum.

Another significant event of this period was the commissioning of the new solvent De-waxing and De-oiling Pilot Plant. Intensive work was done on this unit, along with Engineers India Limited, for the purpose of developing capability for the new

Visit of the then Minister of Tanzania in early 1984

A view of the visbreaking pilot plant furnace section

Visit of Dr. Ferari, the then Minister of Planning, Government of Seychelles during 1983

Visit of Dr. Ferari, the then Minister of Planning, Government of Seychelles during 1983

Visit by Dr. G.S. Sidhu, the then Director General CSIR

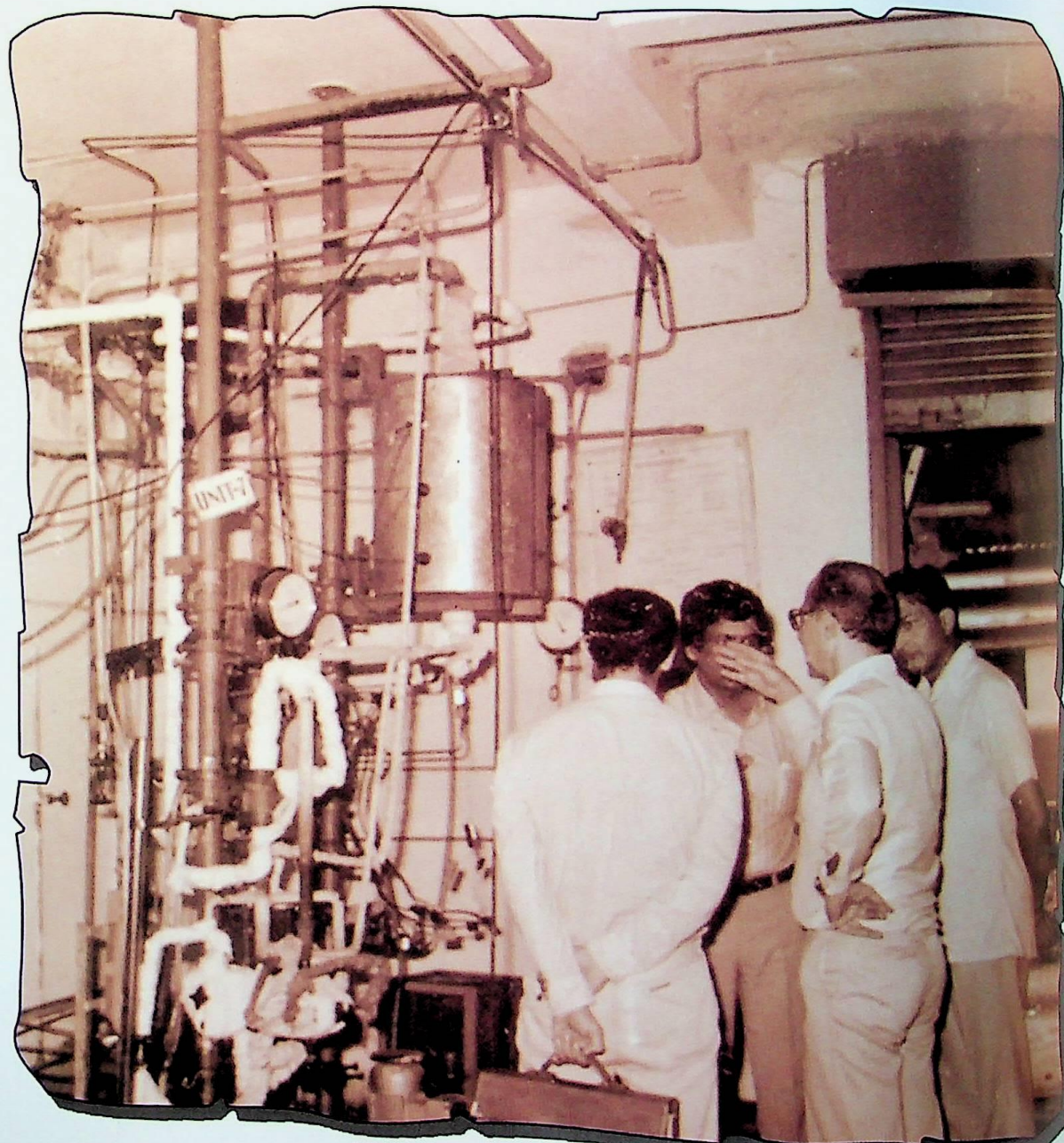
Visit of a delegation of scientist from USA during 1984

Visit of Shri AJA Tauro, the then Chairman, Indian Oil Corporation in 1983.

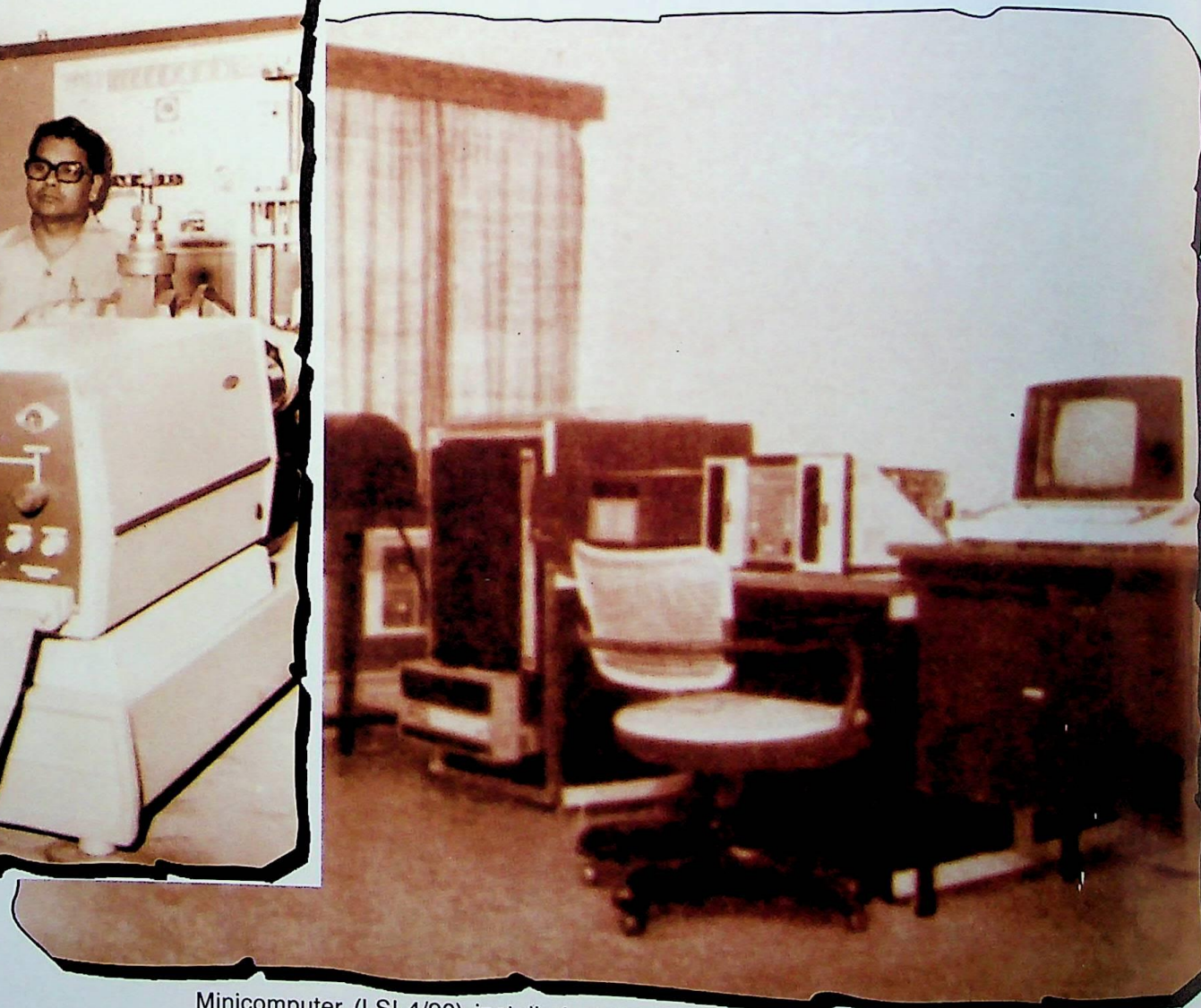
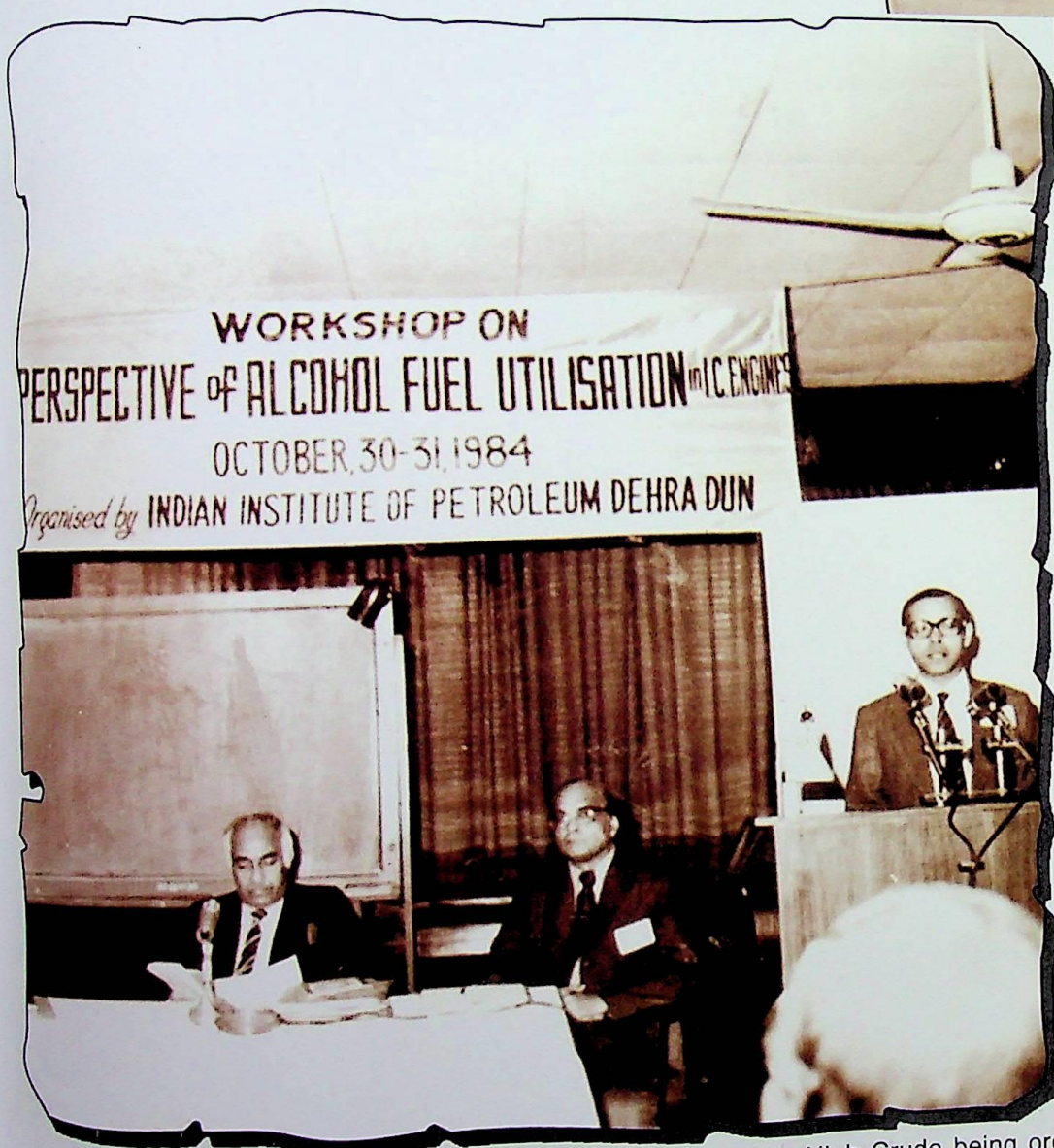
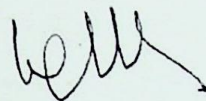
Visit of UNIDO/UNDP expert group to Engines Laboratory to discuss UNDP Phase II assistance programme on application of alternative fuels in IC Engines in 1983.

I am greatly impressed by the IIP's achievements and the programme of work which are of vital importance to the petroleum industry. The visit has been an education to me. We in IOC look forward to continued fruitful association with IIP and are particularly grateful for the training courses run for our young engineers.

[signature] 8/4/83.

(A.J.A. TAURO.)
Chairman
Indian Oil Corporation Ltd.

Visit of Iranian delegation in 1984

Visit of Dr. Munthir Salah the then Advisor to President, Royal Scientific Society of Jordan, Amman, Jordan in August 1984

Visit of the then Secretary, Ministry of Petroleum
Mr. Gill in 1984

Minicomputer (LSI-4/90) installed at IIP for studies on Engine Wear in 1983

Workshop on Bombay High Crude being organised by OCC and IIP in 1984

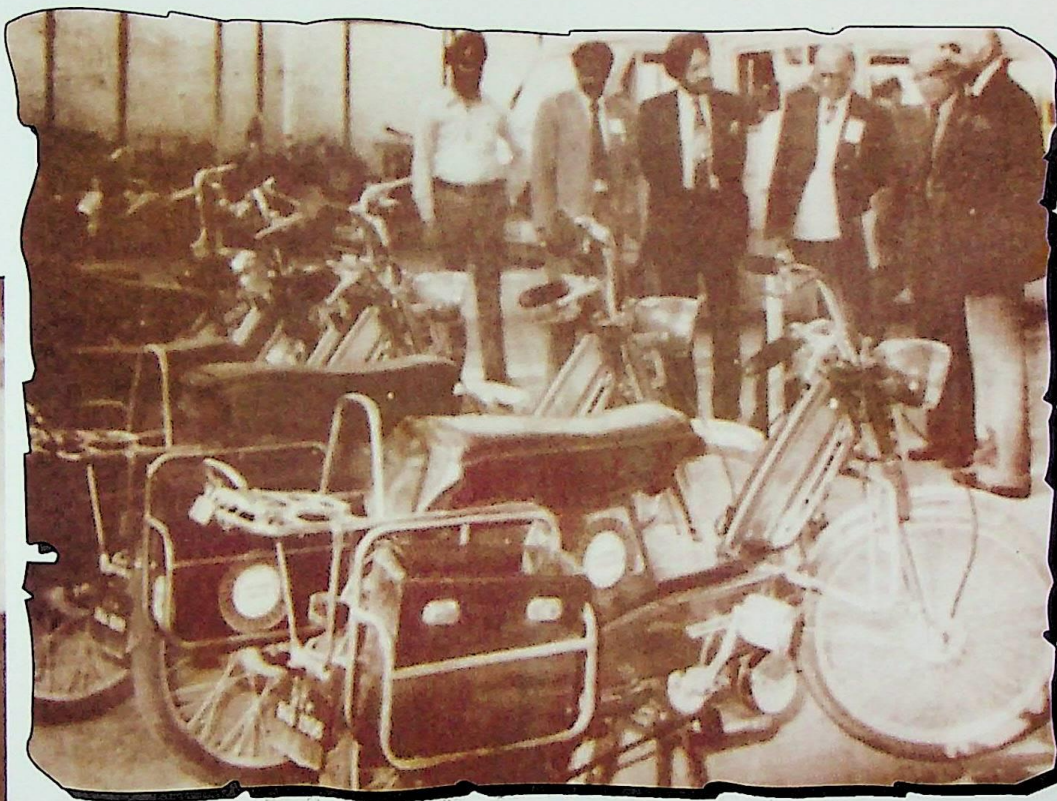
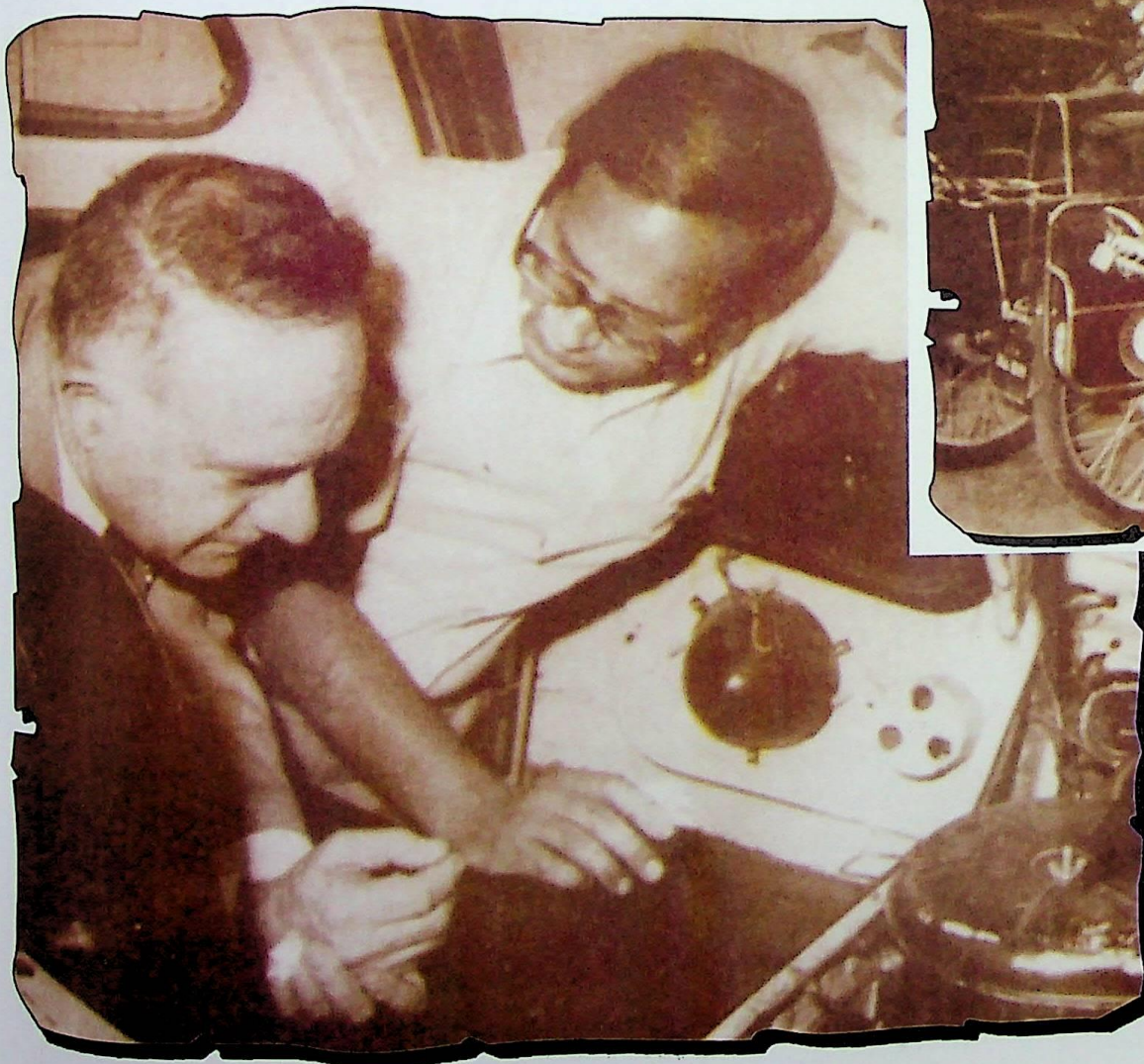
J'ai été très heureux de retourner l'Indian Institute of Petroleum et tous mes anciens collègues.

Je vous souhaite de continuer encore longtemps le bon travail

Amicalement

Y.L. GLADEL – Directeur général BEICIP
23.5-1975

Dr. I. B. Gulati, the then Director, IIP and Mr. Y. L. Gladel, the then Director, IFP, discussing, IIP-IFP draft

Shri Maheshwar Dayal the then Secretary, Department of Non-Conventional Energy Sources along with the participants of Workshop on Alcohol Fuels on a visit to "2-stroke vehicle fleet using methanol fuel" during 1984

Visit of Dr. J.C. Balaceanu the then President and Director General, IFP, France having a look at IIP developed "Methanol Induction Device" fitted on light commerical diesel vehicles during 1984.

proposed wax unit.

The Petrochemical group successfully developed the process for Poly methyl Metha Acrylate (PMMA) using suspension polymerisation techniques. It continued further development work on a number of additives.

In the Product Application area, emphasis was shifted to part replacement of Diesel by Methanol, as a good potential alternative fuel for the country.

The subsequent year saw software being developed by the institute for demand forecasting of petroleum products and work was undertaken for individual major projects to fully support Oil Coordination Committee.

Another landmark achievement was the acceptance of IIP and Engineers India Limited aromatic extraction process for Benzene Production which was set up at the Cochin Refinery. The unit had the capacity of 115,000 t/a of Benzene/Toulene.

The institute during this period also initiated work to develop extraction process for production of ATF from the high aromatic Bombay High and Assam crude's.

IIP contribution in the setting up of Mathura Refinery of Indian Oil Corporation Limited in 1982 was an important milestone for the Institute. IIP was involved in the Product Development services and in Committees on Environmental Assessment and Clearance.

The Naphtha Pre-treater and Catalytic unit of 80,000 t/a based on IIP-IFP process was commissioned successfully during 1984-85 at the Bongaigaon Refinery.

Extensive studies were carried on processing North Gujarat crudes at the Koyali Refinery, covering lube and bitumen production from some isolated heavy crudes of this field and visbreaking of short residue.

Investigations for revamping and expansion of Haldia lube unit and Digboi Refinery Wax Plant were also completed during this period. Pilot plant based visbreaking studies under the Petroleum Process Development Coordination Group (PPDCG) programme, aimed at offering a process for the proposed visbreaker unit at the Panipat Refinery were also carried out.

The mid 1980's also saw a heavy duty chassis dynamometer for trucks and buses been installed in the institute. It was capable of simulating road load characteristics of 20 types of vehicles and was be used for emission, fuel efficiency and alternate fuel studies. The construction of the new 'Combustion Block' having been completed, the Industrial Combustion laboratories were set up. Amongst the other new major facilities set up during the year are a Transient Mode Engine Dynamometer and Pye-Unichem Atomic Absorption Unit. A new laboratory for wax crystallization, wax chemistry, additive interaction and rheology studies has been established under an Oil Industry Development Board programme.

Another prominent development during the year 1984-85 was the preparation of a state-of-the-art report on vehicular exhaust emissions for the Department of Environment, Government of India which paved the way for evolving a national strategy and action plan for control of exhaust emissions in the country.

The Institute continued to provide effective technical inputs to various expert committees and government agencies like the Indian Standards Institution, Petroleum Conservation Research Association, and Advisory Board on Energy, Department of Environment and Department of Non-conventional Energy Sources. It played an effective role in the development of the Seventh Five

Year Science & Technology Plan of the petroleum sector and of the CSIR plan for petroleum and chemical sectors.

The year 1985 also witnesses the aromatic extraction unit at Bharat Petroleum Corporation Limited, Bombay being commissioned. With the commissioning of this unit there was a huge saving of foreign exchange by India. For this technology Dr. B.S. Rawat, Head, Seperation Process Division of the Institute and his team were awarded.

The year 1986 once again saw the change of guards at IIP. Dr. Gulati after a successful tenure of being associated with the Institute since almost its inception as a scientist and later as its Director superannuated. Dr. Rajamani Krishna took over as the new Director in June 1986.

Dr. Krishna was an internationally acclaimed scientist working at the Netherlands University and also had a stint of working with Shell R&D before taking over the reigns of IIP. A person with a very strong temperament he was looked upon as a Director of IIP with a totally different nature compared with his predecessors.

The tenure of Dr. Krishna at IIP was not very long. He served till September 1988 before proceeding on one year leave from IIP.

His tenure besides seeing the continuation of R&D work at
the Institute also saw a thrust on publication of the research work done by IIP. The scientists of the Institute were asked to write for both national and international journals, present papers at national and international forums to propagate the

Industrial Film Burner

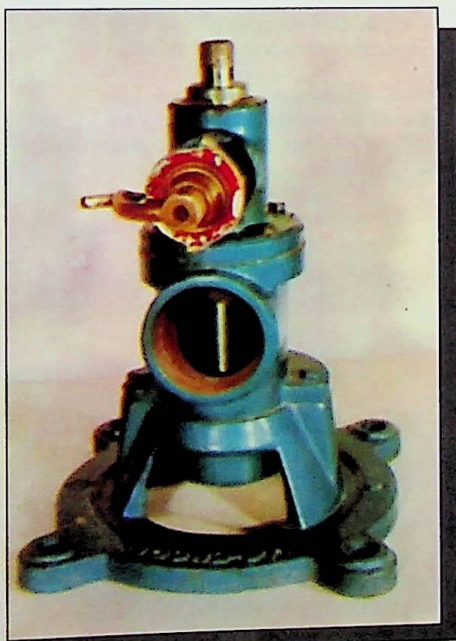
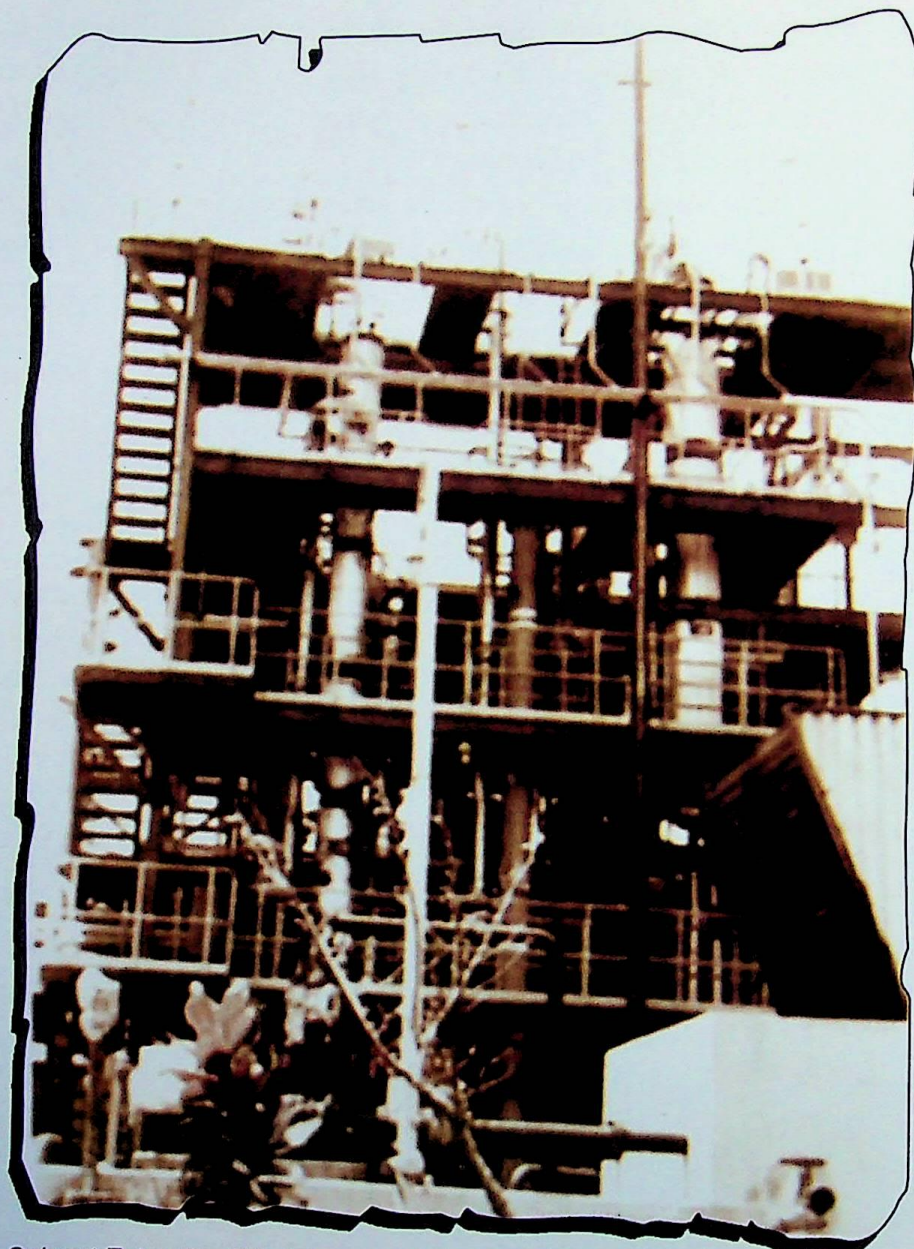
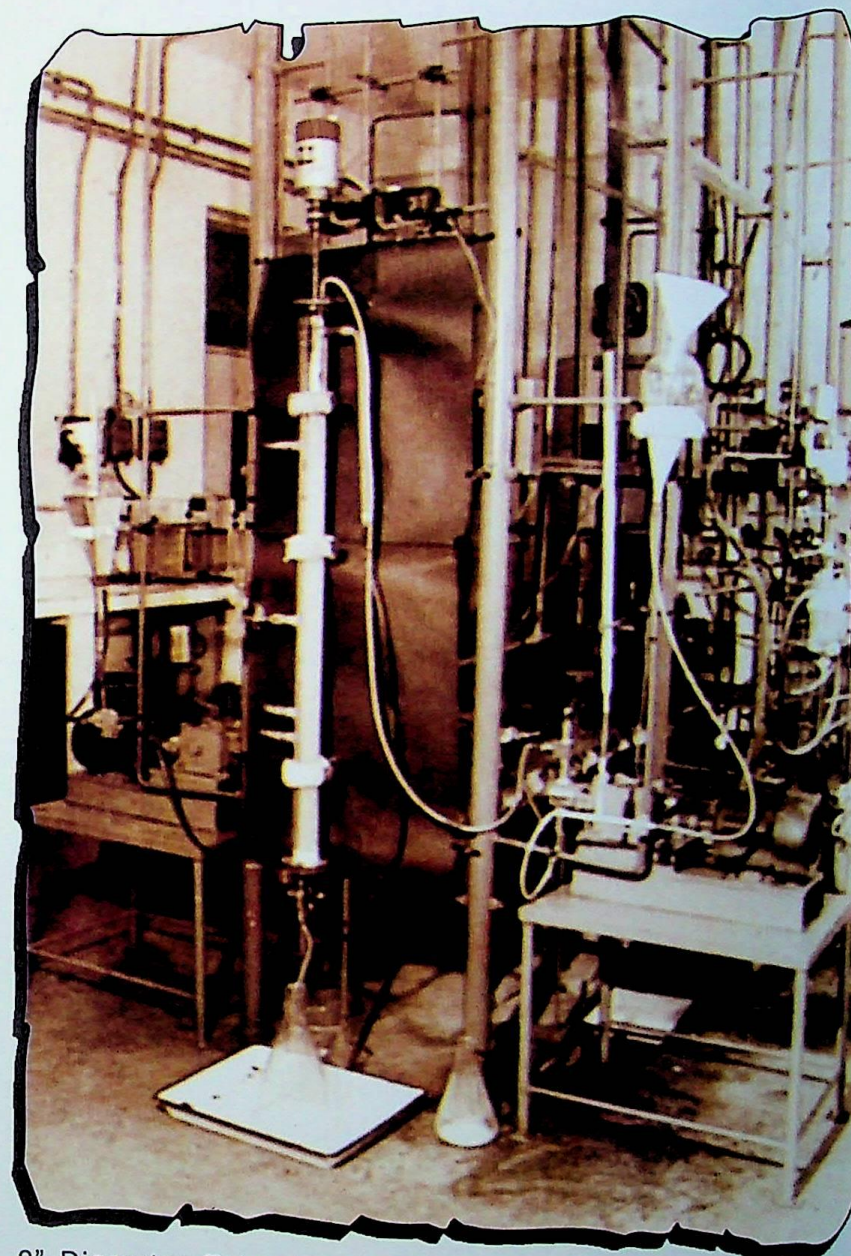
research capabilities of the Institute. Dr.Krishna who himself had great interest for reading and writing was on the Editorial Board of "Gas Separation and Purification Journal" published from UK and "Indian Journal of Technology".

For his contributions towards science and technology, the then Prime Minister of India late Shri. Rajiv Gandhi presented Dr.Krishna the award for "Outstanding Research in Science and Technology".

He was even elected Fellow of Indian Academy of Sciences in 1989 which was a feather in the Institutes cap.

The process for special boiling point solvents and food grade hexane by liquid-liquid extraction with sulpholane using IIP-EIL technology was implemented at BPCL during 1987-88.

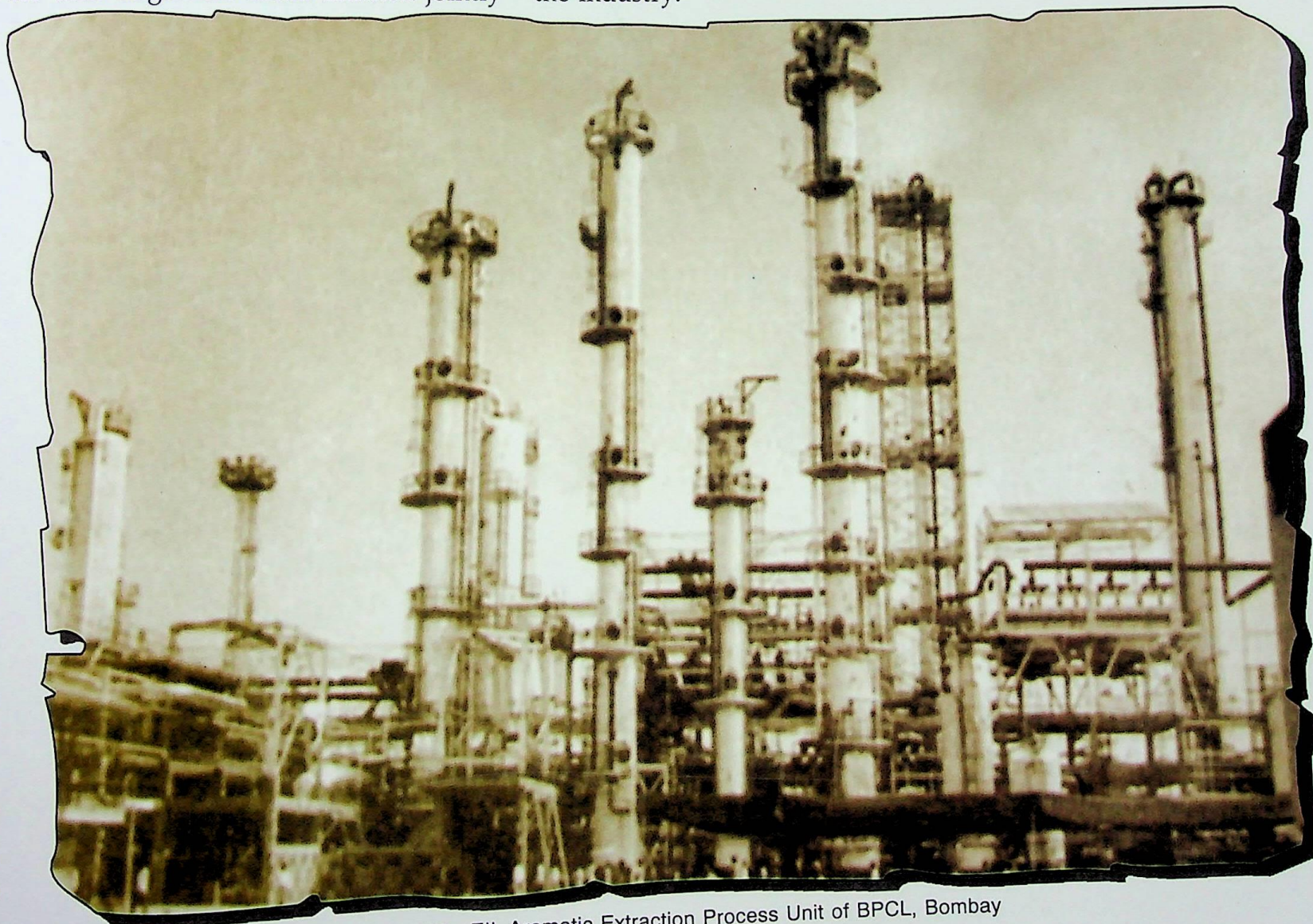
The other processes developed during this period were that of Visbreaking for Indian Oil Gujarat Refinery, LAP Film Burner, Re refining of used engine crank case oil and the development of IIP Kerosene wick stove.

The bi-metallic (Pt-Re) catalyst was developed by the institute during this year. After thorough evaluation at the erstwhile Indian Petrochemicals Limited (IPCL), Vadodara it was found comparable and in some cases superior to the contemporary bi-metallic catalyst. This catalyst was subsequently loaded in the plat former unit of Madras Refinery Limited due to the initiatives of the Scientific Advisory Committee of the Ministry of Petroleum & Natural Gas, Government of India. The encouragement provided in the entire episode by late Shri Lovraj Kumar, former Secretary, Ministry of

Solvent Extraction Pilot Plant at HPCL Bombay (ATF & Food Grade Hexone Technology Development)

2" Diameter Extraction Column being used for Studies on dearomatisation of Naptha and Kerosene using Liquid Membranes on a continuous Scale.

Petroleum & Natural Gas needs a special mention. Shri.Lovraj Kumar was a doyen of the Indian oil industry.

The year also saw IIP and Engineers India Limited jointly receiving the NRDC Award for developing the solvent extraction process for production of pure aromatics from Naphtha.

With the moving out of Dr. Krishna in 1988, Mr.Sudhir Singhal the then Head of Petroleum Products Application Division of IIP took over as the acting Director. This was an important phase for IIP as it was entering its Silver Jubilee year.

The period of 1988-89 saw IIP increase its interaction with the industry. During this period IIP and EIL received a Government of India award for excellence in technology development for the process of extraction of aromatics from naphtha streams with sulpholane, a technology which was successfully implemented by the industry.

IIP - EIL Aromatic Extraction Process Unit of BPCL, Bombay

The Silver Jubilee period of IIP

The year 1989 saw IIP celebrating its Silver Jubilee. The strength that emerged in the 25 years of existence of IIP can be stated as the availability of expertise in every aspect of petroleum science and technology which was a matter of pride for India.

A Seminar on oil conservation being organised by IIP as part of its Silver Jubilee Celebration during 1989.

The then Petroleum Minister Shri Bhram Dutt along with the then Chairman ONGC Col. S.P. Wahi and Acting Director Shri Sudhir Singhal at the inaugural function of IIP's Silver Jubilee Function during June 1989.

The year 1989 saw IIP celebrating its Silver Jubilee. The strength that emerged in the 25 years of existence of IIP can be stated as the availability of expertise in every aspect of petroleum science and technology which was a matter of pride for India.

By this time IIP had three research and development divisions: the Refining Technology Division, Chemical Sciences Division and Products Application Division. TheRefining Technology Division was sub-divided into Seperation Process Division, Conversion Process Division and Crude & Product Evaluation Division. The Chemical Sciences Division comprised of Organic Chemistry Division while the Petroleum Application Division was sub-divided into Petroleum Products Application Division and Industrial and Domestic Combustion Division.

The technical Divisions were supplemented by an Infrastructure Division and the Administration Divisions. The Infrastructure Division comprised of Industrial Liaison Group, Engineering Services Group and the Library.

The silver jubilee was a great moment for the Institute. It witnessed many events to commemorate the occasion. Prominent among them was a get-together of scientists organised at the institute which discussed "Petroleum processing and Product utilisation technological needs and R&D strategy beyond the silver jubilee" The meet was inaugurated by Mr.Brahm Dutt, the then Minister of State for Petroleum & Natural Gas, Government of India and attended by eminent personalities of the Industry, Representatives of IFP, France, Academia, Technologists and Scientists of petroleum and petro-chemical industry.

The Silver Jubilee function also marked a Petroleum Conservation Day, Sports Day and IIP Mela.

This period also saw IIPs links with the industry becoming increasingly stronger. During this period IIP-EIL sulpholane extraction technology for aromatics and food grade hexane was accepted for commercial unit. A Memorandum of Understanding for the development of NMP extraction technology for food grade hexane and for transfer and up gradation of technology for the production of white oils was signed. This period also saw aromatics recovery unit at Bharat Petroleum going into commercial production.

IIP continued its efforts during this period on consolidating and focusing on projects of industrial significance together with those on basic and applied research. In view of the increasing involvement of the Institute in the Research & Development programmes for the industry, the functioning of technical support services like Industrial Liaison and Engineering Services were sharpened.

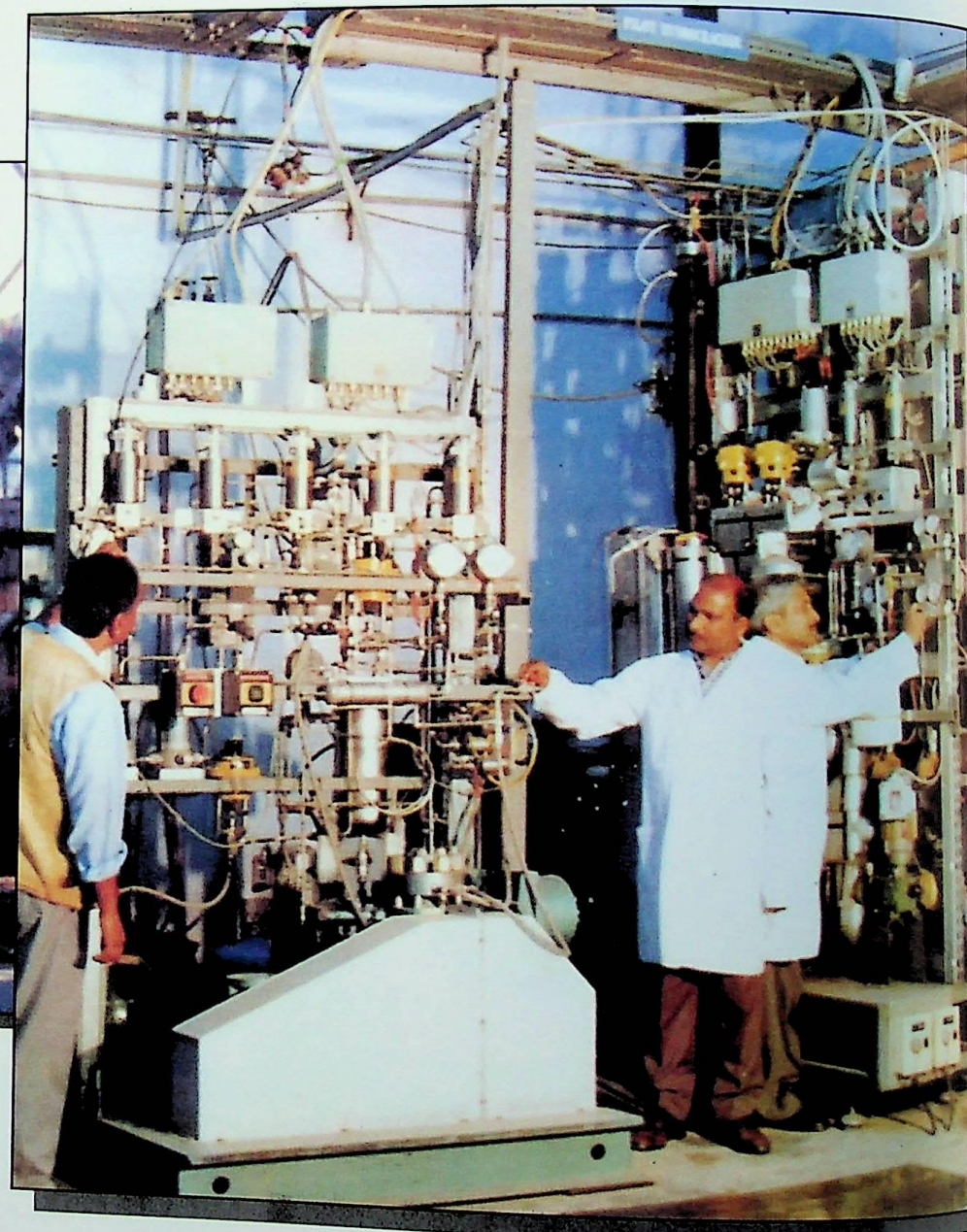
The Era of Collaboration (1991-2000)

Having carved out a niche position for itself in the petroleum sector in its 25 years of existence, IIP geared up in the 1990's and took up even more extensive and fruitful interactions with the industry while simultaneously pursuing excellence in science.

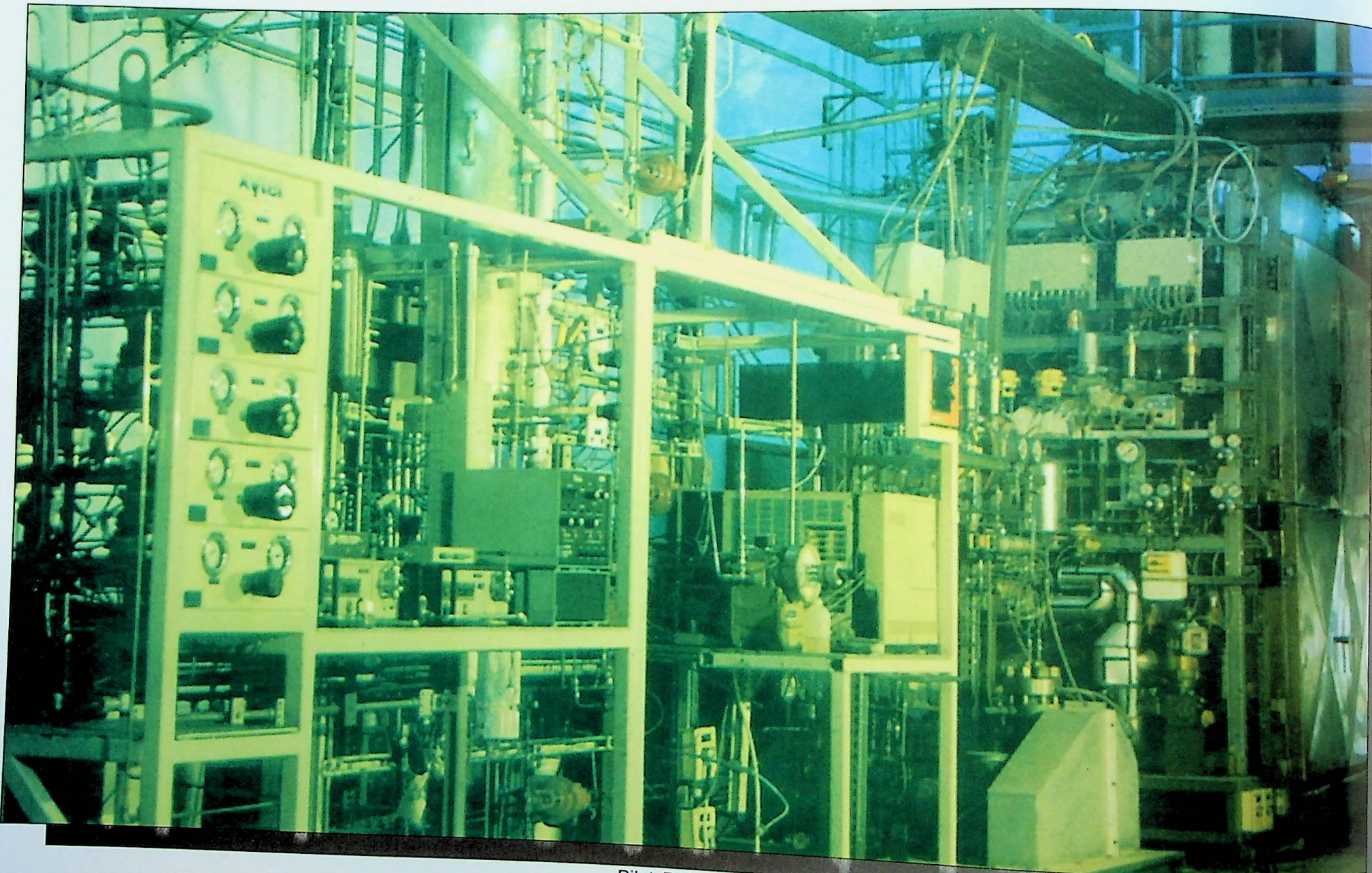
Having significant achievements under its belt like the development of bi-metallic catalyst, development of technology for production of Aviation Turbine Fuel, IIP prepared itself for another leap in achieving technological excellence.

The beginning of the decade of 1990's was a big boost for

The then Director General, CSIR Dr. S.K. Joshi presenting the CSIR Technology Award to Shri R.P. Mahrotra, the then Area Leader, Conversion Processes, Catalysis, IIP and his team of scientist

A View of the Catalytic Reforming Unit

Hydrocracker Unit in early 1990s

A view of the bench scale unit for sulfolane process

High Resolution Mass Spectrometer with Capillary GC and Data System

Pilot Reformer Unit

Sonprep 150

the institute as it received the first CSIR Technology Award 1990-91 for the development of Aromatic Extraction Technology. This award demonstrated the inherent capability of IIP.

The year 1990 saw Dr. T.S.R.Prasada Rao taking over the reigns of the institute from Mr.Singhal in the month of September. Dr.Rao's tenure upto January 1999 not only saw a spurt in the activities of the institute particularly in terms of commercialising technologies and forging international relationships. Dr.Rao brought a distinct visibility to the great work being done by IIP scientists both within the country and abroad.

Dr. Prasada Rao, a Ph.D. in Inorganic Chemistry from Andhra University, Visakhapatnam in 1968 was an internationally known scientist in the area of catalysis. He had a long experience of working with the erst while IPCL where he occupied various important position before joining IIP. Some of his major contribution to science and technology in India related to catalysts and processes for naphtha reforming and xylene isomerisation. His areas of professional interest were oxidation and ammoxidation of hydrocarbons, catalytic reforming, isomerisation, dehydrogenation, zeolite catalysis and adsorpotion, hydro treating and other related aspects. His tenure therefore saw, massive collaborative research activities, development of new and innovative technologies and their marketing.

All the R&D programmes during the early 1990's were covered under four broad research areas (Petroleum Refining Technology, Petroleum Products Application, Chemicals and Intermediates and Petroleum Bio-technology) with the sole objective of implementing the programmes more effectively and rationally.

In the area of Petroleum Refining Technology significant achievements were made to transfer the know-how in major thrust areas. IIP in collaboration with Indian Petrochemicals Limited (IPCL) developed a state-of-the-art Pt-Re bi-metallic reforming catalyst which was a major break through in the catalyst development technology, which had so far been the monopoly of multi-nationals. This is the single largest catalyst technology developed indigenously.

A novel beginning was also made in the field of Fluid Catalytic Cracking (FCC).

For the first time in India, IIP had initiated a study on the separations of hydrocarbon types using liquid membrane. The technology was found to be more energy efficient than that of solvent extraction, since it was carried out at an ambient temperature.

During this year, the activities of the institute's R&D programmes were actively supported by infrastructural facilities. Instrumental techniques provided analytical back-up to various sponsored and in-house projects through chromatographic and spectroscopic techniques like XRD, NMR, GC, GC-MS, UV, IR, AA, AE etc. and also by carrying out various physico-chemical and performance property measurements.

A variety of specialised techniques and test methods were also developed for various research programmes. The activities of the institute during this period saw a leap towards the future.

The advent of liberalisation

The advent of liberalisation, in 1991 and the new industrial policy of the Government of India opened new opportunities for foreign investors to establish their industries and this lead to a market with novel products.

IIP already enjoyed a unique advantage of serving the petroleum

The First IIP industry meet at Mumbai

The Second IIP industry meet at Chennai

Late Shri Lovraj Kumar, a great supporter of IIP Activities

I have been associated with IIP virtually from the start but now I am particularly
associated with it in the Research Committee. I am gratified that in its 30 years
of existence it has dominated the Indian Refining scene & virtually every refinery
in the country has units based on technology developed by IIP. The future poses an
even greater challenge & with its past success IIP is well placed to
face these challenges with confidence based on proven performance that is
recognised by the Indian Refining Industry.

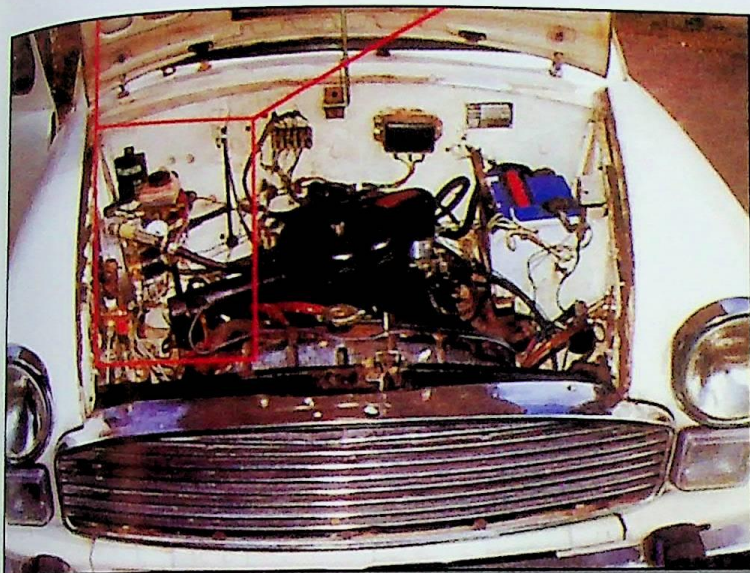
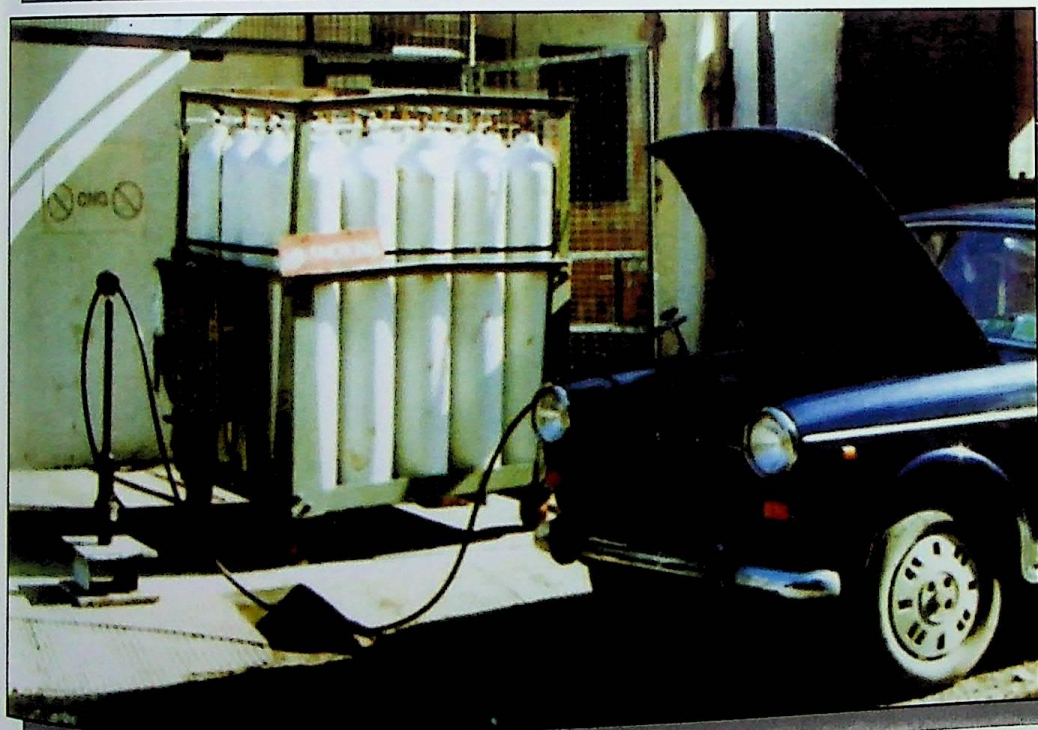
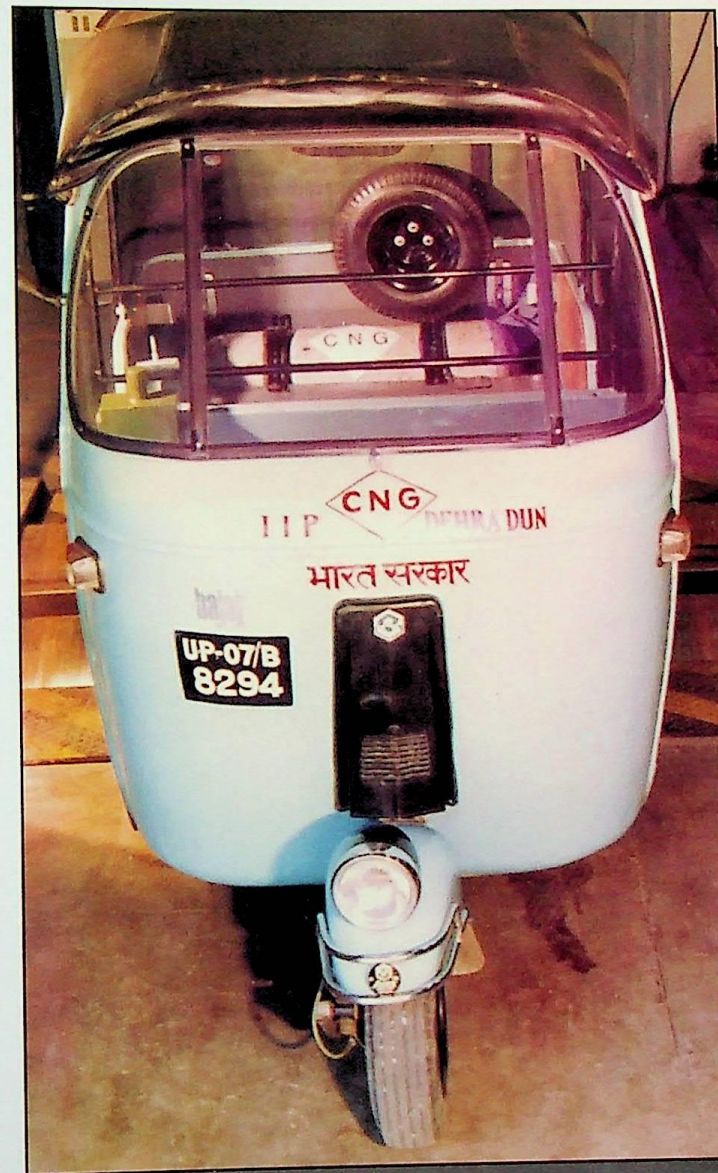
Lovraj K.
9/5/1992

I have been associated with IIP virtually from the start but now I am particularly associated with it in the Research Committee. I am gratified that in its 30 years of existence it has dominated the Indian Refining scene and virtually every refinery in the country has units based on technology developed by IIP. The future poses even greater challenge and with its past success IIP is well placed to face these challenges with confidence based on proven performance that is recognised by the Indian Refining Industry.

Late Shri Lovraj Kumar at IIP

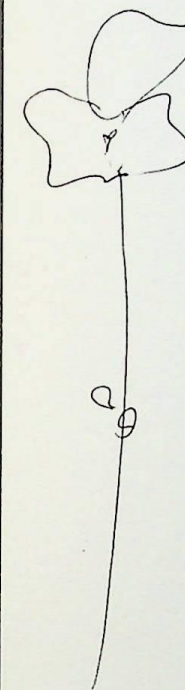
Shri Lovraj Kumar felicitating Shri S. Krishna Kumar, the then Minister of State for Defence and Petroleum & Natural Gas as Chairman, RC, IIP during Shri Krishna Kumar's visit to IIP.

The tenth meeting of the Research Council (RC) of IIP was held on December 4, 1994. It was chaired by Shri Lovraj Kumar, Chairman, Scientific Advisory Committee, Ministry of Petroleum and Natural Gas, Government of India and Chairman, RC, IIP. The meet was attended by all the other eminent members of the RC.

Mr. Bhuvesh Chaturvedi, the then Minister of State for Science & Technology presented the CSIR Shield for Process Technloogy to IIP for the year 1993 on December 10, 1993. The award was presented to IIP for developing technology related to production of food grade hexane using sulfolane as solvent. The award was received by Dr. B.S. Rawat the then Area Leader, Separation Processes, Refining Technology Division. The development of this technology was the result of several years of R&D efforts needed to evolve the process know how. The development of this technology not only resulted in saving precious foriegn exchange through indigenous production of food grade hexane but it was also offered for export.

CNG Kit Mounted on a Passenger Car during 1996 to evaluate its road worthiness as per the then Motor Vehicle Act.

A car being filled with Compressed Natural Gas (CNG)

ETL-CNG System Three Wheeler Auto Rickshaw

A bus converted by IIP to run on Methanol

Prof. Herman J. Lovink, Akzo Noble Catalysts, The Netherlands with the then Director IIP Dr. T.S.R. Prasada Rao, Dr. P.K. Mukhopadyaya former Director Indian Oil R&D Centre (extreme right) and Dr. S.N. Sharma the then Incharge Internation Scienfic Collaboration, IIP (extreme left) during 1995.

Shri Abid Hussain the then Vice President, Rajiv Gandhi Foundation taking keen interest in IIP Laboratories with the then Director IIP.

To visit IIP was like going on a pilgrimage. I met in this temple of Knowledge & Science, men with a spark of Divinity & Creativity. Their devoted work is bound to produce miracles of Science which would fuel the progress of the Country. I'm sure that under the dynamic leadership of Dr. Prasad Rao the Lab would scale Himalayan heights of glory. May his tribe increase. Amen.

14th April 94

Abid Hussain

and petro-chemical industry whose annual turnover was well beyond Rs.40,000 crores. Unique and new initiatives were required to expose the industry to the institute's potential and capabilities in various areas. The organisation of IIP Industry Meet at Bombay (now Mumbai) and then in Madras (now Chennai) during this period was one such effort in this direction.

The Industry Meets were highly successful and attended by eminent industrialists, key decision makers of oil and petrochemical companies, Scientists and Technologists representing over 70 industries. With the guidance of Shri. Lovraj Kumar and Dr. S.K.Joshi, the then Director General, CSIR, the Industry Meet enhanced the Institute's image and highlighted its capabilities and potentials.

As a result of these efforts IIP continued to march ahead hand in hand with industry. It had sponsored projects worth crores of rupees to its credit.

The Institute scaled newer heights on various frontiers in 1992-93. During the year the Institute ventured into the new area of adsorptive separation in addition to continuing its thrust on the development of catalysts and process packages, anti-oxidants, alternative fuels and fuel quality.

The Institute also concentrated on basic studies in the areas of liquid membranes for removal of phenolics from water waste streams, generation of basic LLE and VLE data on hydrocarbon/solvent systems of industrial importance, flow characteristics of waxy crudes and designing of wax improvers, support of catalysis-Y-zeolite modification for RFCC catalyst and hydro cracking support, newer zeolite pentasil type for gasification and aromatisation of light naphtha and CNG, development of models for thermo fluid, thermo kinetics of conversion and experimental studies related to flow process and ignition characteristics for 2-stroke engines, modelling of wear in lubricated contracts and studies on running-in wear mechanisms of piston liner materials as well as mathematical simulation of fuel/air mixing including wall jet behaviours and combustion in diesel engine.

With its phenomenal successes, the institute bagged the CSIR Best Technology Award for the year 1992, the second time since this award was instituted in 1990. The award was given for developing state-of-the-art Bi-metallic Platinum Rhenium Reforming Catalyst, placing India in the list of a select band of four countries of the world possessing this sophisticated technology.

The year 1993-94 was again a successful year for the Institute. Besides numerous recognitions in the form of awards, on the technology front, IIP filed six patents and submitted 18 patents for filing.

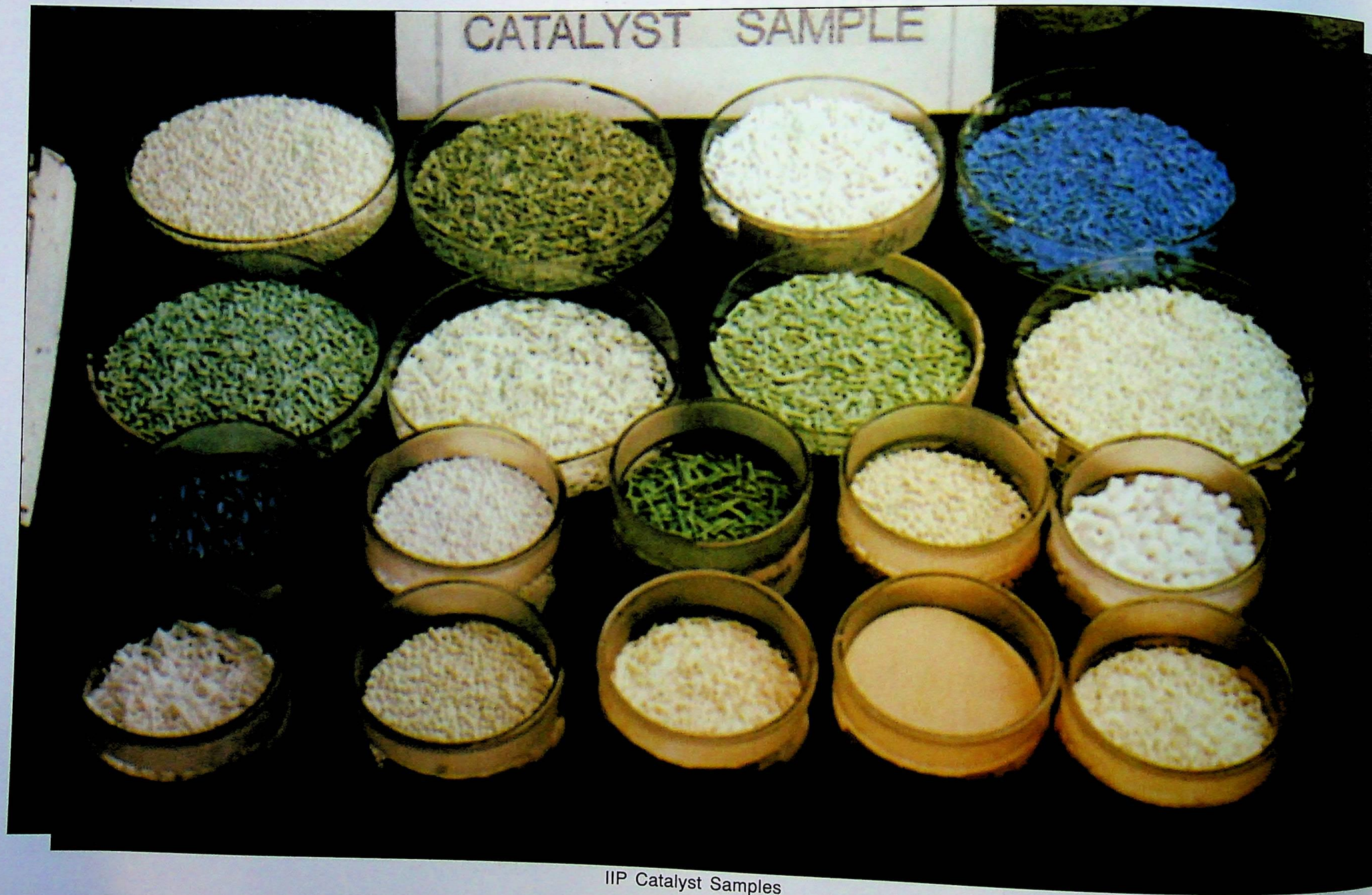
The Institute transferred many processes and technologies for the commercialisation by industry; the important ones were the processes for two butylated phenol based anti-oxidants, aluminium and lithium complex grease, know-how for liquid phase adsorption technology for production of petrochemical grade hexane and basic engineering package for speciality chemicals namely BHT, PTPB, OBHC, PDBHC and MHHC.

The Institute also developed successfully NMP based technology for lube extraction; the technology for making petroleum based impregnating pitch for graphite industry and paving grade bitumen's from waxy crude oils and speciality lubricants like white oil, turbine oil and rubber processing oils.

The haul of awards by IIP continued in 1994-95. For the third successive year IIP bagged the prestigious CSIR Technology Award for the development of an efficient multi-fuel industrial burner.

IIP-IFP Process-based Catalytic Reformer Unit at the Barauni Refinery

Propane Deasphalting Pilot Plant

Lube Extraction Unit at Haldia Refinery

IIP Catalyst Samples

Bed Sweetening Pre-Treating Unit

IIP initiative towards Mini Refinery concept for remote parts of the country where crude oil is available in smalll quantities and its transportation is not cost effective.

Plaque of CSIR Business Development and Technology Martketing Award recieved by IIP in 1996

As for the number of patents filed in India, IIP with 22 patents during 1995 stood second in the family of CSIR laboratories.

The World Bank loan of Rs. 15 crores helped the Institute precure the most modern equipments for ensuring international quality work and enhancing its overall research facilities.

To enhance communication a computer network with internet facility was installed in the Institute.

The year 1996 once again saw IIP bagging the CSIR Technology Award for business development and technology marketing. This award was considered as a recognition of IIP's efforts towards changing its focus from mere research and development activities to answering the needs of the market forces as well.

In the year 1996-97 while successfully transferring several technologies at national level, efforts were made to make IIP global. Several multi-national companies like IFP, Stone & Webster, Haldor Topsoe, UOP, Glitsch, Mobil (now Exxon-Mobil), BP-Amoco and many others expressed keen interest in IIPs research work and technologies. Many companies from USA and Japan visited the Institute to forge alliances.

Amongst the outstanding agreement signed was that with UOP for collaborative R&D efforts.

IIP signed an agreement with Stone & Webster to jointly market its Soaker visbreaking technology worldwide. Visbreaking is a thermal cracking process to upgrade atmospheric and vacuum residue (of atmospheric distillation) to light and middle distillates. The Stone & Webster Technology Corporation, USA is one of the world's leading engineering, construction and Consultancy Company.

With Mobil, IIP entered into a technology marketing agreement, where by IIP marketed their technology while Mobil agreed to market IIP's lube extraction technology world-wide.

The collaboration with BP Amoco along with Indian Oil Corporation Limited and GAIL(India) Limited was entered to commercialise a clean burning fuel such as Di-methyl Ether (DME).

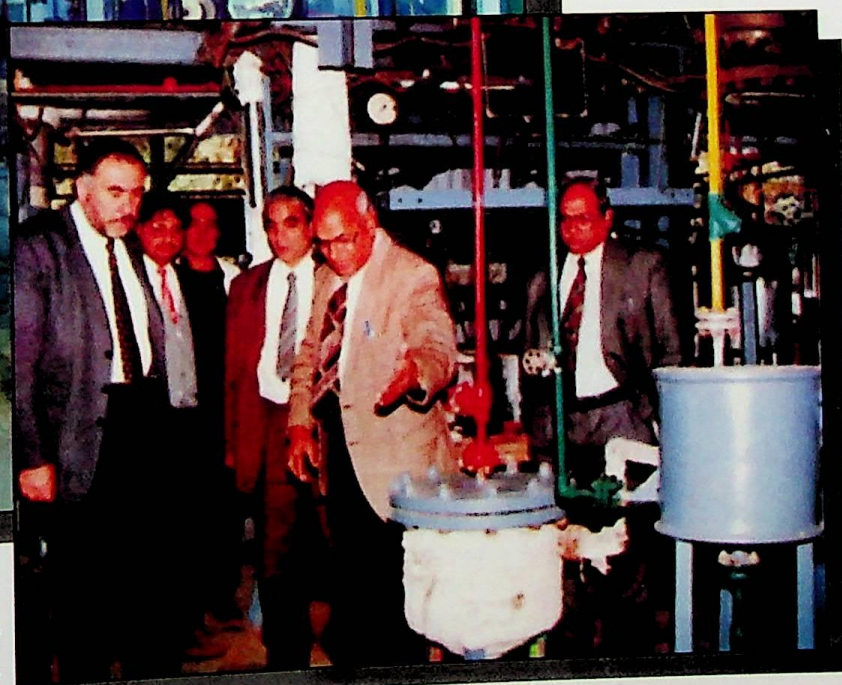
IIP and Engineers India Limited even joined hands with Glitsch Technology Corporation (GTC) for marketing its solvent extraction technology.

The institute entered into an agreement with the United Technologies Inc. (UTI), USA a Chicago based NRI company for setting up mini-refineries in India.

IIP's efforts for excellence and innovation in the area of petroleum refining led to the development of a process for conversion of NGL/light naphtha into LPG and high octane gasoline. As an environmentally conscious organisation, IIP also developed a catalytic converter which reduced harmful emissions from four stroke engines effectively and also technology for use of CNG and other alternative fuels in three-wheelers.

In the areas of chemical, intermediates and additives, IIP's endeavour for generation of innovative processes and products resulted in getting several sponsored projects for technology transfer to national and international industries in private sector. Notable amongst there were secondary alcohols, adipic acid and EP additives.

The year saw the Institute successfully developing and transferring technologies for production of food grade hexane and special boiling point solvents, NMP-based lube extraction, petroleum

Visbreaking pilot plant

Senior Scientists and the then Director of IIP showing the Visbreaking pilot plant to Mr. Jorge A. Bonilla, the then Vice President (Technology) Stone & Webster, USA. The transfer of this technology was considered a big achievement by IIP as it was picked up by Stone & Webster, USA after a thorough examination of its quality.

Dr. A.K. Gupta the then Area Leader, IIP and his group of scientist recieved the 1997 CSIR Technology Award for developement and commercialisation of technology package comprising process know how and basic engineering for Tetra-Methylene Sulphane "Sulpholane" from eminent scientist Prof. Yashpal. CASIL Health Produces Limited, a Cadila Pharma Group Company scaled up the bench technology developed by IIP to become the third largest producer of Tetra-Methylene Sulphane "Sulpholane" in the world. The other two companies producing Sulpholane then were Shell, UK and Phillips Petroleum, USA. This technology during 1997 had helped save India precious foriegn exchange worth US$ 3 million annualy.

Sulphonate-EP Additive Plant
at Hyderabad

Sulpholane Plant on IIP Technology at Ahmedabad

sulponates, petroleum based impregnating pitches, high temperature anti-oxidants, eco-friendly lube additives, highly thermal efficient combustion appliances etc.

The high point of the period 1997-2000 was that the Institute emerged as an undisputed leader in its areas of research as it bagged the prestigious CSIR Technology Award continuously for 1997, 1998, 1999 and 2000 for developing and successfully commercializing the technologies for sulpholane production, soaker visbreaking, propane deasphalting and LOBS production through NMP extraction respectively. With this, IIP set a record of getting nine CSIR Technology Awards in eleven years since it was instituted. This was a unique distinction for any CSIR Institute.

The 1997 CSIR Technology Award for development and commercialisation of technology package comprising process, know-how and basic engineering for Tetramethylene Sulphane "Sulpholane" was given to IIP scientists Dr.A.K.Gupta, Dr.H.B.Goyal, Dr.K.S.Jauhari and Shri.K.G.Sharma.

CASIL Health Producers Limited (CHPL), a Cadila Pharma Group Company scaled up the bench technology developed by IIP to become the third largest producer of Tetramethylene Sulphane "Sulpholane", The production of Sulpholane at CHPL's state-of-the-art plant at Kadi near Ahmedabad helped India save foreign exchange to the tune of US$ 3 million annually.

The development of a process Naphtha/NGL to LPG and Gasoline (NTGG) after years of research by IIP successfully converted light naphtha to LPG along with high octane gasoline blending stock as a co-product. The process was unique in utilising a novel zeolite catalyst, developed by IIP to convert selectively n-paraffins and mono branched iso-paraffins present in light naphtha to LPG and gasoline blending stocks.

This led to a major achievement of the Institute in the recent times in terms of commissioning of IIP's NTGG Process at GAIL India Limited's Vaghodia plant. This process converts low value condensates and light naphtha to LPG and high octane gasoline blend stocks.

The growth of IIP both within and outside the country as an Institute providing quality research and innovative technologies was endorsed by the award of ISO-9001 certification in 1998. During this period IIP intensified its efforts to exploit its potentials to the maximum possible extent. These efforts showed results in terms of a jump in its business income from the industry.

IIP and GAIL India Limited collaborative research programme for developing DME a substitute for diesel, LPG. DME can be used as a fuel for power plants.

Improved Indsutrial Gas Burner (Pre-mix type) developed by IIP

Demonstration Unit for Naphtha to Gas and Gasoline Technology at Vaghodia, Gujarat

The era of consolidation and diversification (2001-2010)

The golden aura of IIP of the nineteen nineties greatly uplifted not only the research activities of the institute but even the morale of its people. The best brains were there at IIP to tackle any industry challenge.

The period 2001-02 saw the Institute set up "Vision 2010" for itself. The vision laid considerable importance on the new generation fuels and lubricants.

This period also witnessed the dismantling of Administrative Price Mechanism (APM) in the petroleum sector as well as its disinvestment and globalisation. The dismantling of APM in April 2002 followed the need to establish a road map for the future auto fuels of the country as well as introduction of alternative fuels in the fuel mix available to the customers. For the first time an Auto Fuel Policy was formulated. CNG was introduced in Delhi and its use was made mandatory in all the commercial vehicles. Fuel from renewable sources viz. ethanol was introduced for blending with gasoline and a renewed interest was seen in commercialisation of bio-diesel.

With an eye on the future, the Institute embarked upon projects which were essentially multi-disciplinary in nature, drawing expertise from multiple disciplines within IIP so that the need for alternative transportation fuels such as ethanol, bio-diesel and hydrogen from renewable sources can be met.

A major initiative was also taken to develop gas-to-liquid technologies and bio-lubricants.

The Institute during this period had to its credit of being involved in eight network projects initiated by CSIR wherein IIP was the nodal laboratory for the network project on 'New Generation Fuels and Lubricants'.

The momentum of the activities at IIP got a further fillip from the present Director Dr. M. O. Garg who took over in August 2003 from Dr. A.K.Gupta, Scientist-G who was acting as Director after the superannuation of Shri. Sudhir Singhal in July 2003.

A Fellow of the Indian National Academy of Engineering, Dr. Garg is an internationally acknowledged expert in advanced separation technologies, process design, modeling and simulation, advance control, process integration, petroleum refining and petrochemicals.

Being a technocrat having wide research experience of working in both public and private sector, Dr.Garg has been very ably leading the Institute with a modern approach as also strengthening its international collaborative research programmes, and diversification programmes.

His major contributions over the years at IIP have been in the fields of Solvent Extraction, Revamping of licensed technologies, Process design of pilot plants commercial units and Pinch Analysis and Process integration.

Dr.Garg is a well acknowledged and international expert in the area of Process Integration. The vast expertise he has gathered in this area is a result of working closely with Linhoff-March of UK prior to his joining IIP. This important area holds much relevance to the Institute as it is in line with IIP's mandate to bring value to its customers. An active Group has also been formed at IIP which specialises in this area.

In addition to the aforesaid contributions, there have been

several innovative ideas of Dr.Garg which have contributed to the research of IIP and its clients. A few major ones are: Oxidative desulphurization of diesel using homogeneous catalyst (This ideas has resulted into a patent), Use of room temperature of ionic liquid as a green solvent for solvent extraction of aromatics from naphtha, Recovery of NMP from brine solution (HPCL implemented this idea and saved crores of rupees of worth of NMP), Revamp of benzyl alcohol plant of Daurala Sugar Mills, Daurala in order to convert the process from batch to continuous, Scientific investigation of operation of retail outlets including identification of losses of hydrocarbons during marketing, and Agreement with NRL to market IIP/Engineers India Limited deoiling technology.

The Logo of IIP launched on the occasion of the CSIR Foundation Day on September 26, 2004

Since 2003 when Dr.Garg took over as the Director he has modernised the mass emission laboratory to carry out tests as per Euro-III and Euro-IV standards. He steered the CSIR network project on "Development of New Generation Fuels and Lubricants" conceived in 2000-2001 which involved networking of six laboratories i.e. IIP, NCL, IICT, CFRI, RRL Jammu and RRL Trivandrum. The project was evolved with the aim of working on new generation fuels and lubricants keeping in view the depleting resources of fossil fuels.

In the Eleventh Five year plan he initiated the developement of know-how and technology for environmental friendly conversion and utilization of biomass to fuels, lubricants and additives. His efforts towards initiating projects on pet coke

संस्थान गीत

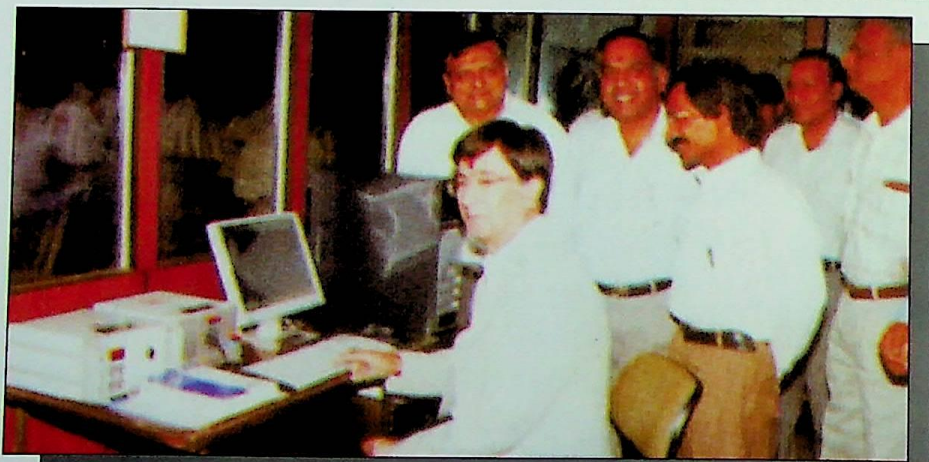
तेरी जय जयकार करें हम, करें सदा तेरा गुणगान
हे मेरे भारतीय पेट्रोलियम संस्थान

देहरादून की पावन धरती, बना है तेरा सुन्दर धाम
सघन हरित पर्वत दिशाएं, करती हैं तुझको प्रणाम
शोध कार्य के लिए समर्पित, दुनियां में पाता सम्मान
हे मेरे भारतीय पेट्रोलियम संस्थान

औद्योगिक विकास के लिए, नित–नित खोज नई करता
भारत की समृद्धि के लिए, हर पल है तत्पर रहता ।
वैज्ञानिक–तकनीकी क्षेत्र में, रहे सदा अग्रिम स्थान
हे मेरे भारतीय पेट्रोलियम संस्थान

हम सब मिलकर करें साधना, इसका मान बढ़ाएंगे
इसकी छाया में नित अपनी, ज्ञान की जोत जलाएंगे
हम सबकी है यही कामना, बनी रहे तेरी पहचान
हे मेरे भारतीय पेट्रोलियम संस्थान

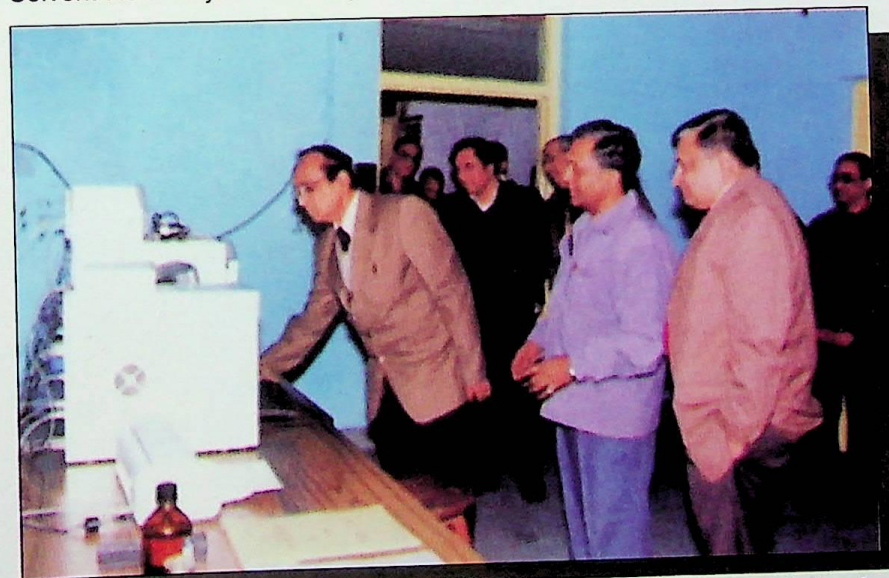
The first Institute Song

Dr. M.O. Garg, Director IIP giving a presentation to Shri S.C. Tripathi the then Secretary, Ministry of Petroleum and Natural Gas and Shri Y.B. Sinha the then Director (Exploration), ONGC on the Institute's strengths and capabilities during Shri Tripathi's visit to IIP in July 2004.

Shri Ulrich Podewils the then Director, Regional Office DAAD, New Delhi handing over the Spray Imaging System in April 2004

Dr. M.O. Garg, Director IIP explaining to Shri S.C. Tripathi about the research work done by the Institute in the field of Bio-diesel in July 2004.

Shri S.C. Tripathi inaugurating the Journal Bearing Rig Unit in July 2004

Dr. R.A. Mashelkar the then Director General, CSIR inaugurating the New Solvent Recovery Unit in May 2004

Shri S.C. Tripathi inaugurating the Automated Adsorption Unit in July 2004

Dr. K.S. Balaraman the then Executive Director, Center for High Technology inaugurating the Supercritical Fluid Chromatograph.

gasification, biomass conversion and new generation bio diesel technology, gas to liquid technologies, CO2 capture and hydrogen needs special mention.

His initiative has led to collaborative R&D front activities with international companies such as SINTEF, RTI, UOP, CDTech, Conoco Phillips, IFP, SABIC, BP/ Castrol, UNILUBE, PETROBRAS which has been greatly beneficial for the Institute and Indian industry at large.

The other collaborative research projects initiated by him are with international research institutes/ universities like Korean Institute of Science & Technology, Korea, Leibitz Institute for catalysis at University of Rostock, CNR-ISMN, Italy, Technical University of Munich University of New Castle Upon Tyne, UK,University of Huddersfield.

Dr. M.O. Garg, Diector IIP recieving the Uttarakhand Ratan Award from the then Governor of Uttarakhand H.E. Shri Sudharshan Agarwal. The Award was bestowed on Dr. Garg by the All India Conference of Intellectuals in the "Indian Petroleum" category in July 2004.

His efforts to license IIP's solvent extraction technology to a petrochemical complex in the UK for production of pure aromatics from straight run naphtha will be the first application of its kind in the world.

A large scale commercial unit based on IIP technology would come up soon in Jubail Industrial city, Saudi Arabia as a result of his providing leadership to successful development of NMP based extraction technology for re-refining of used lube oil for Unilube Saudi Arabia.

Dr.Garg has helped MOBIL in commercialising MSDW technology at IOC, Haldia under IIP/MOBIL agreement as also commercialized IIP's Sweetening Catalyst, NTGG Technology, Visbreaker Internals in Indian refineries, Food Grade Hexane, biodiesel technology, etc. in Indian refineries.

His efforts on the collaborative research front have initiated collaboration with SINTEF which resulted in successful development of adsorptive based technology for gasoline desulphurization. In view of this the Norwegian Embassy has awarded a second project along with SINTEF for adsorptive desulphurization of diesel.

He has even conceptualized and executed an innovative project on converting waste plastic to valuable hydrocarbon

products such as LPG, gasoline, diesel and light aromatics.

The Department of Science and Technology has awarded Rs. 4.5 Crores for creating a new laboratory to position IIP as a National Laboratory to test and certify biodiesel in the country.

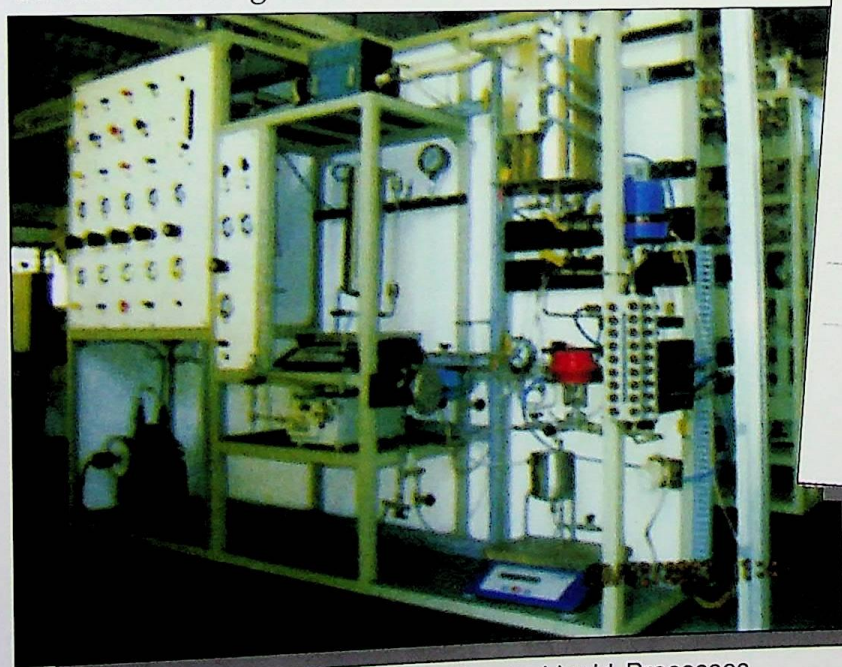
Maintaining the tradition the Institute once again bagged the CSIR Technology Award 2006 for commercializing comb type polymer as dewaxing aid.

IIP has also signed a long term agreement with Ministry of Petroleum & Natural Gas to run the Fuel Testing Laboratory at NOIDA.

Today, with all these areas of research and business development there is a visible change seen in IIP's functioning as it is recognised as a truly new age research and development institute for the downstream industry.

Besides very ably steering the Institute since 2003 when he took over as the Director, Dr. Garg's management skills were endorsed by CSIR by giving him additional charge as Director, Central Building Research Institute (CBRI) a CSIR Institute at Roorkee. Dr. Garg has served CBRI very efficiently for more than two years before its permanent Director has been placed very recently.

In recognition of its capabilities the Institute has received the accreditation of ISO-9001:2000 in December 2003.

Having already met successes in commercialising its NTGG Process, Bio-diesel production Processes, Development of Zeolite

Pilot Plant Facilities for Gas to Liquid Processes

DNV

DET NORSKE VERITAS
MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 00942-2004-AQ-NDE-NABCB

This is to certify that the Quality Management System of

INDIAN INSTITUTE OF PETROLEUM

At

P.O. IIP, Mohkampur, Haridwar Road, Dehradun - 248 005, Uttaranchal Pradesh, INDIA

has been found to conform to the Quality Management System Standard:

ISO 9001:2000

This Certificate is valid concerning all activities related to.

DEVELOPMENT OF PRODUCTS AND PROCESSES AND EVALUTION & TESTING OF PETROLEUM AND ITS PRODUCTS

Original Certification date: 2003-12-16

This Certificate is valid until: 2006-12-15

Compliance to the Standard in respect to the indicated scope is verified by the DNV approved registered Team Leader:

Daya Prakash
Lead Auditor

NABCB
QMS 001

Place and date Chennai, 2004-03-09

for the Accredited Unit
DNV CERTIFICATION SERVICES, REGION INDIA

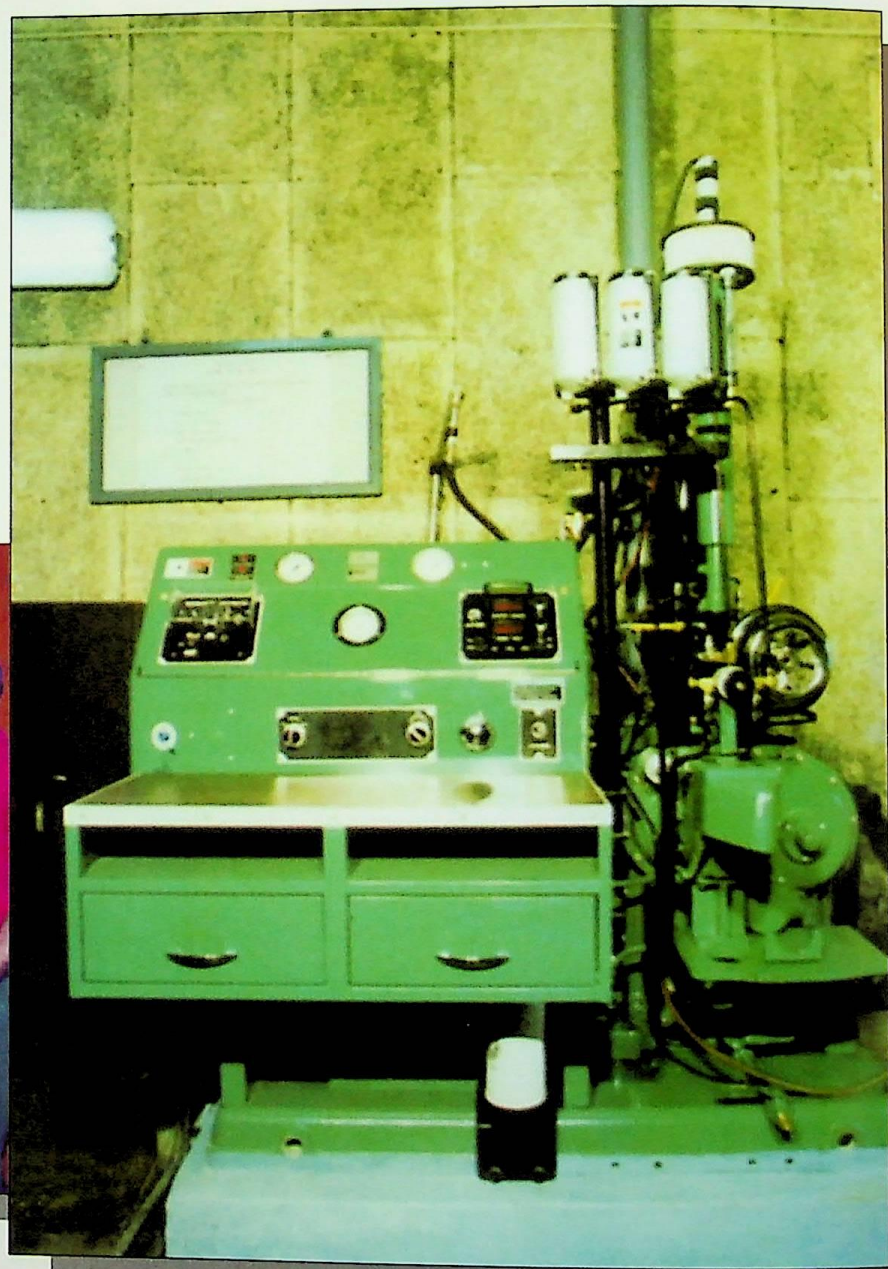
Krishnakumar N.R.
Country Manager

Lack of fulfillment of conditions as set out in the Appendix may render this Certificate invalid.

IIP recieves re-certification of ISO9001:2000

based reforming catalyst, IIP during this phase developed re-extraction technology for dearomatization of middle distillates. The Institute also developed two indigenous catalysts superior to commercial catalysts one for liquid phase sweetening of LPG and light petroleum fractions and the other for sweetening of heavier petroleum fractions like FCC, gasoline, kerosene, ATF and Visbreaker Naphtha. The other technologies included Polymer modification bitumen, Visbreaker internals, C5-C6 isomerisation catalyst, Helium production and upgradation of FCC re-cycle oil.

To further its linkages abroad, IIP and SINTEF, Norway collaborated under the Indo-Norwegian Development Programme for development of adsorption based process for desulphurization

IIP signs a MoU with Mangalore Refinery and Petrochemicals Limited to develop modalities of co-operation for selected research, development, engineering and technology projects identified by one or both the parties.

New Co-operative Fuel Research Unit

The first Indo-Norwegian Seminar on Adsorption Technology held at IIP during February 2005. The Seminar was a joint intiative by IIP and SINTEF, Material and Chemistry, Oslo, Norway.

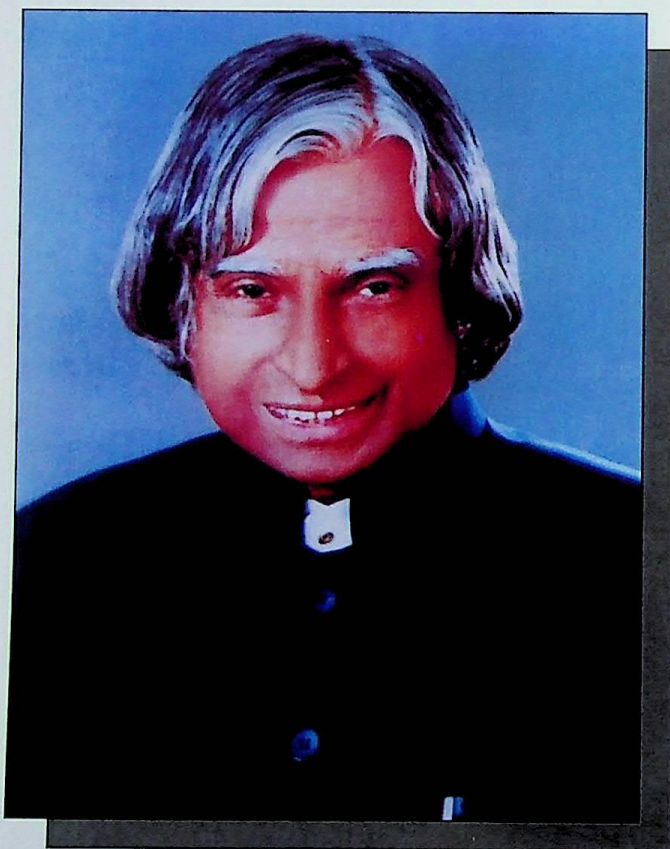
of FCC gasoline. SINTEF is a non-profit foundation which performs contract research for industry, private organisations as well as public authorities.

Keeping in view the great contribution of IIP towards the nation, the most significant event of 2005 was the first ever visit of H.E.President of India, Dr. A.P.J. Abdul Kalam to IIP on August 14, 2005.

The visit of Dr.Edmund Daukoru, OPEC President and Minister of State for Petroleum Resources, Federal Government of Nigeria during October 2005 were moments of great pride for IIP and its scientists.

To stimulate the scientific work-force to cope up with these challenges, IIP organised many national and international conferences. On the IIP Foundation Day (April 14, 2006) the Institute organised the International

Historic Visit.

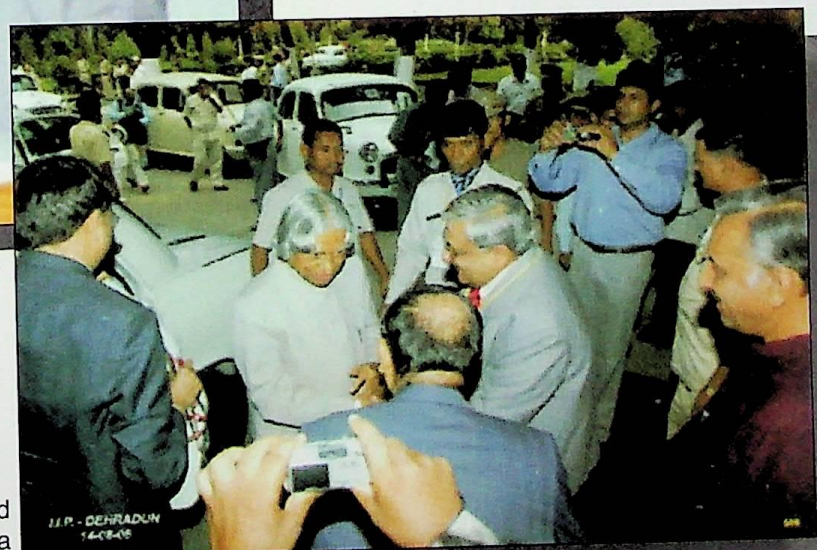
H.E. The then President of India Dr. A.P.J. Abdul Kalam visits IIP, 14.08.2005.

Delighted to visit Indian Institute of Petroleum
Dehradun.

Hearty Congratulation for the excellent Contributions

A. P. J. Abdul Kalam
14/8/05

August 14, 2005 was a day of utmost significance in the history of IIP as on this day His Excellency, The Presdient of India, Dr. A P J Abdul Kalam visited the Insitute. The significance of the day can be gauged from the fact since its inception in 1960, this is the first time that the President of India paid a visit to the Insitute. In spite of his very hectic schedule at Dehradun he addressed the scientific community of the Institute, giving a definite direction for future research. He also invited questions from the audience and answered at length. Along with this most exalted dignitary, H.E. the then Governor of Uttarakhand, Mr. Sudarshan Agarwal and the then Union Minister of Petroleum & Natural Gas, Mr. Mani Shankar Aiyar were also present.

The Director, IIP along with senior scientists of the Institute recieving the then Minister of Petroleum and Natural Gas, Shri Mani Shankar Aiyar at IIP.

The then President of India shares a point with Dr. M.O. Garg, Director during his visit to IIP on August 14, 2005.

The Director, IIP along with the then Minister of Petroleum and Natural Gas Shri Mani Shankar Aiyar recieving the President of India Dr. A.P.J. Abdul Kalam at IIP.

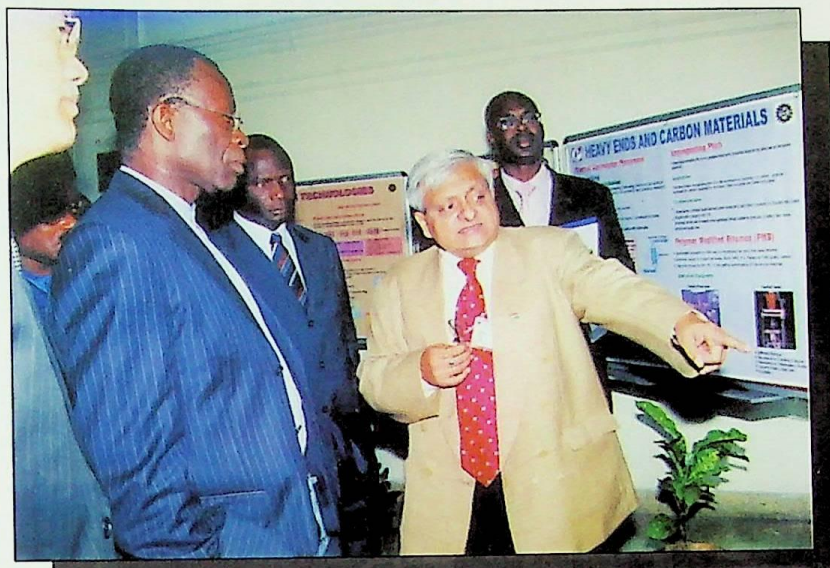
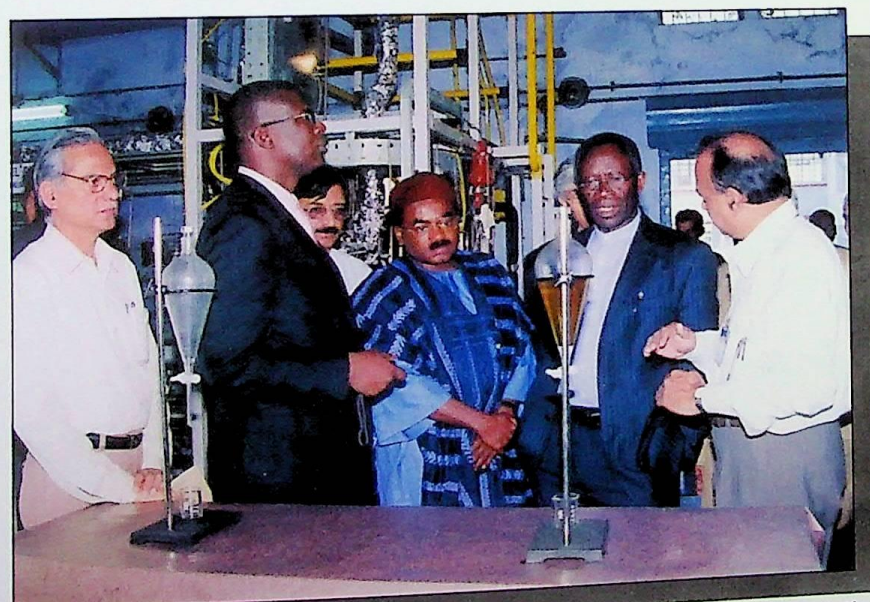
The then OPEC President and Minister of State for Petroleum Resources and Amb. Adamu Waziri, Minister of Commerce, Federal Government of Nigeria visits IIP

Very impressed by the innovative research. Can make a big difference to the energy mix in future years as well as achieving practical gains in renewables in the short term. Nigeria will follow these developments with a view to benefitting in a collaborative way.

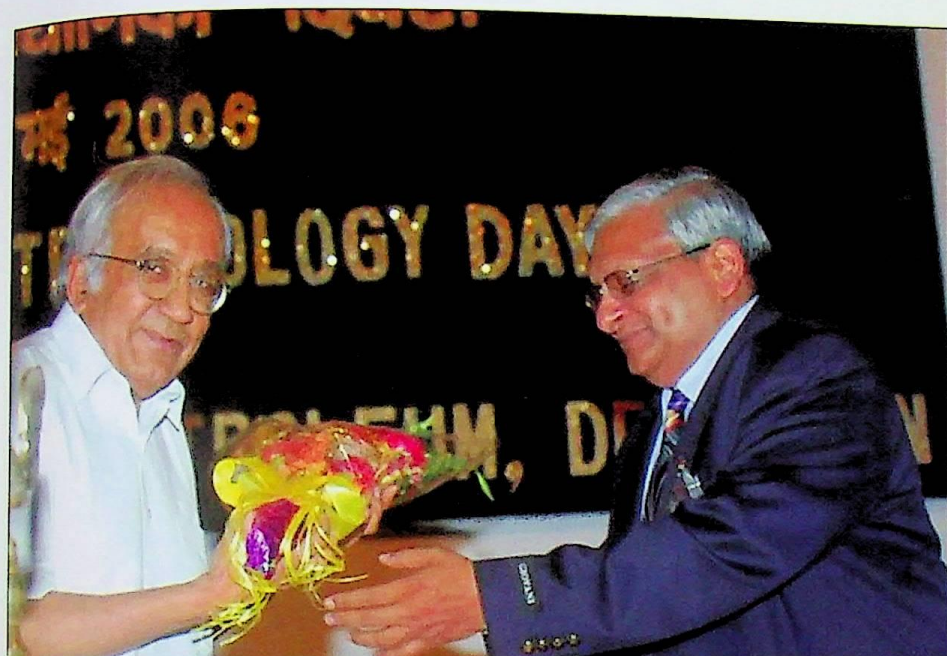
12/10/05
AMB. A. A. IDRIS WAZIRI
HON MINISTER OF COMMERCE
NIGERIA

DR. E. M. DAUKORU
MIN. OF STATE, PETROLEUM
NIGERIA
12/10/05

Dr. M.O. Garg, Director IIP welcome OPEC President and Minister of State for Petroleum Resource and his delegation to the Institute on October 12, 2005

Dr. M.O.Garg with Mr. Edmund Daukoru at IIP's bio-fuel laboratory.

Dr. M.O.Garg with Mr. Edmund Daukoru

Mr. Edmund Daukoru and members of the Nigerian delegation at the bio-diesel Pilot Plant

Dr. A.K. Gupta and Shri V.S. Saini senior scientists showing the Nigerian Delegation a Jatropha Plant

RTI-IIP Seminar on
"Technologies for Gasification of Carbonaceous Feedstocks & Syngas Utilization"

Dr. Kirit S. Parikh, Member, Planning Commission, Government of India being welcomed by Dr. M.O. Garg at IIP during May 2006

Dr. Kirit S. Parikh, Member, Planning Commission along with Dr. M.O. Garg and senior scientists of IIP during May 2006

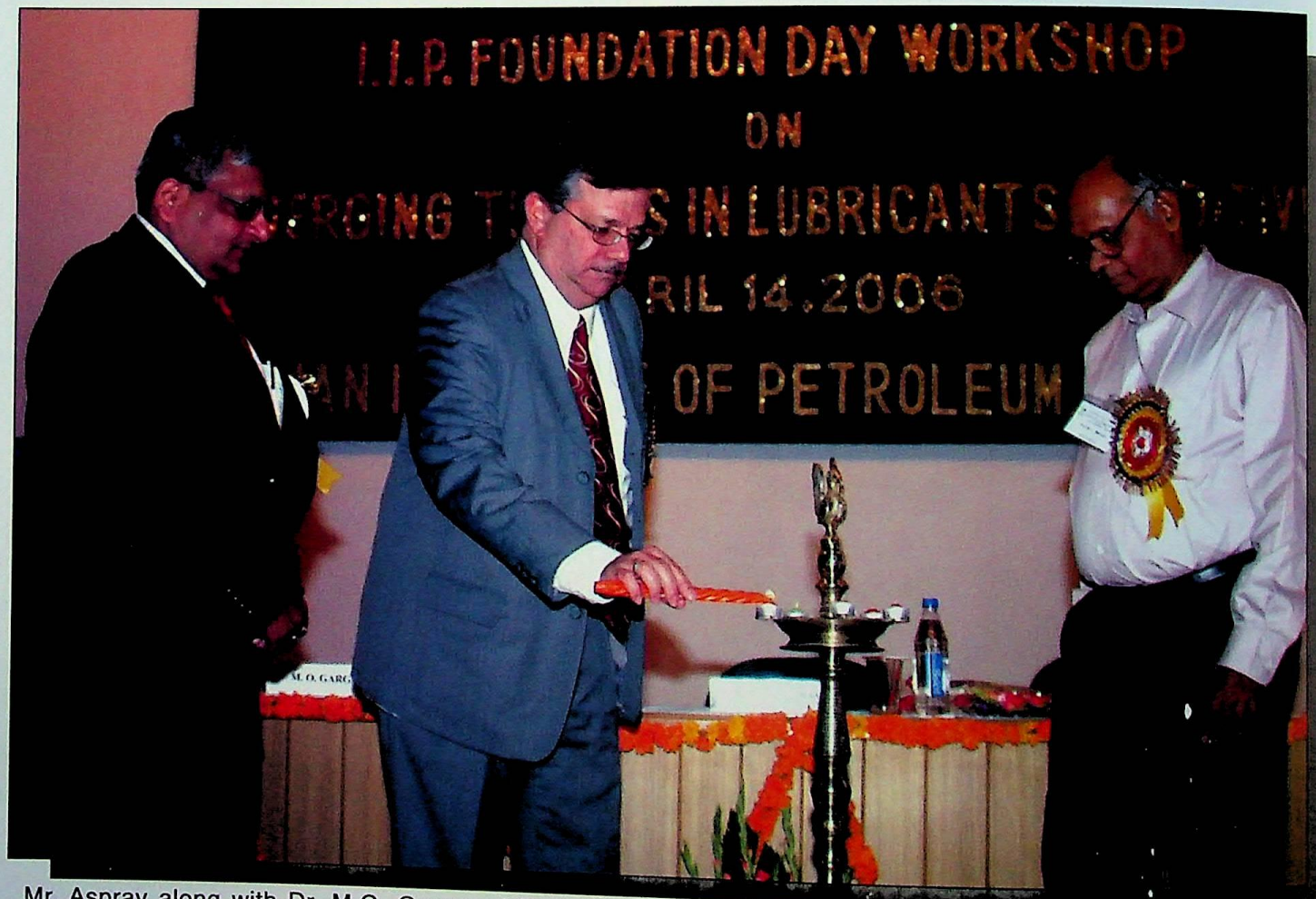
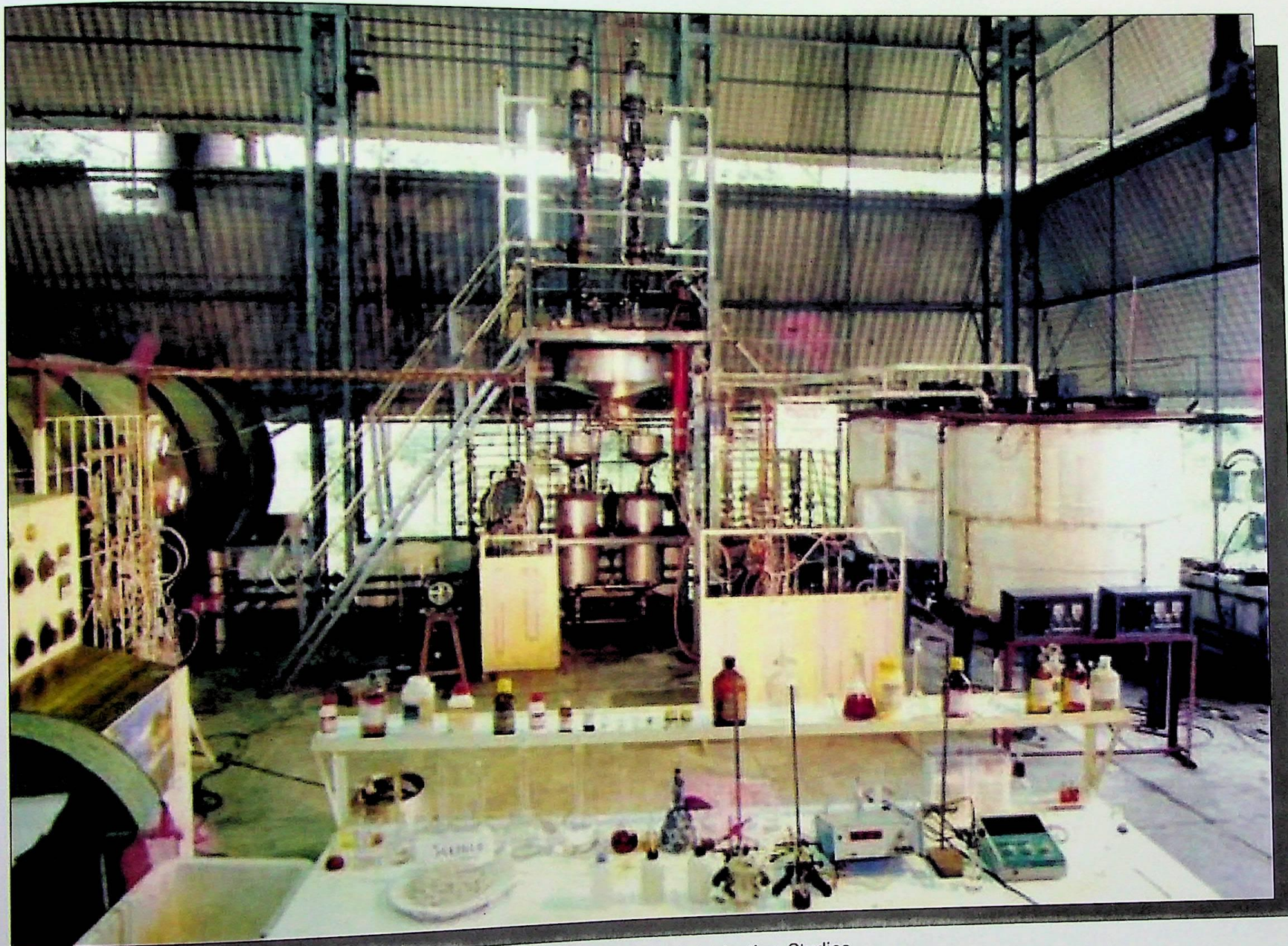
I am delighted to be at IIP, an institute that has played a pioneering role in the development of petroleum technology in the country. There are even more challenges facing the country in the energy field and I am sure we can expect continuing contribution to meeting these challenges from the IIP. I wish the Institute ever more success in developing technologies and in commercializing them. That is the most prized reward of a researcher.

Kirit S Parikh
11.5.06
Member, Planning Commission.

Workshop on 'Emerging Trends in Lubricants & Additives'which was attended by various oil and gas companies and petroleum sector organizations of India. The event was inaugurated by Mr Keith J Aspray, Managing Director, UOP India Pvt Limited inaugurated the event.

The Institute also had the honor to host the 18th National Symposium and Indo-US Seminar on Catalysis, a three-day event of the Catalysis Society of India (CSI) with the theme 'Catalysis for Future Fuels'. The seminar was organized by IIP & CSI in association with the PetroTech Society of India and the Indo-US Science & Technology Forum (IUSSTF) during April 2007.

More than 400 delegates including those from USA, UK, Japan, Mexico, Denmark and Norway, discussed the issues related

Mr. Keith J Aspray the then Managing Director, UOP India Pvt. Limited addressing the IIP Scientists on the 46th IIP Foundation Day on April 14, 2006

Mr. Aspray along with Dr. M.O. Garg and Prof. M.C. Dwivedi lighting the lamp to inaugurate the Workshop on Emerging Trends in Lubricant and Addditives at IIP.

Plot Plant for gas Desulphurisation Studies

Overview of GTL lab containing Synthesis gas generation unit, high temperature fixed-bed reactor and high pressure fixed-bed reactor units for FT and DME sysnthesis

to catalysis, particularly the challenges for its application in production of cleaner fuels.

A 'Workshop on Popularization of Improved *Gur Bhatti*' was organized in association with the Petroleum Conservation Research Assocation (PCRA).

The Institute also hosted the meetings under the CSIR Network project on developing new generation fuels & lubricants during 2006.

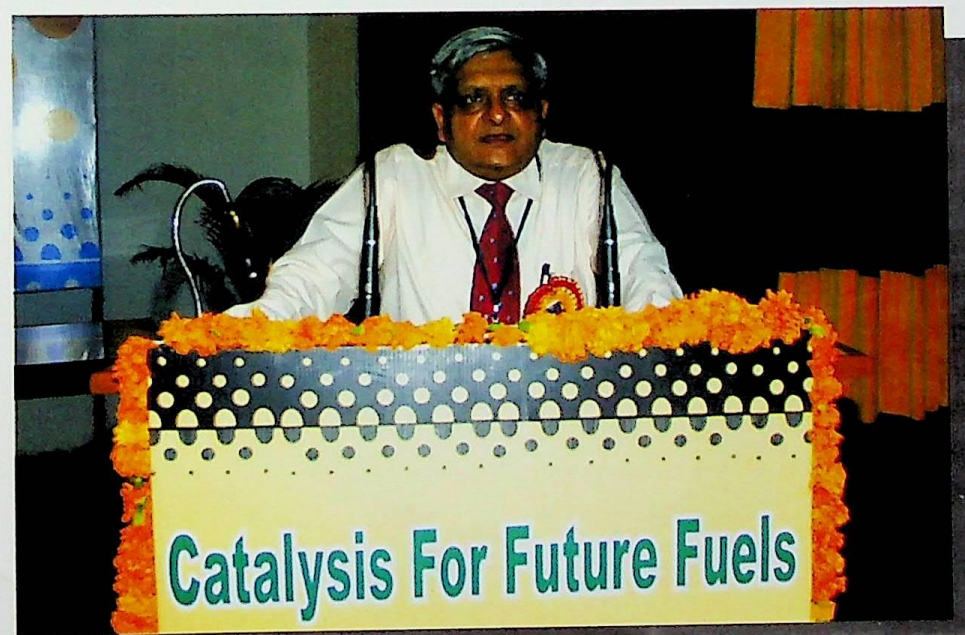
Facilities were created to carry out research in areas of Fischer-Tropsch and DME synthesis, ethanol from starch and cellulose, bio-degradable lubricants and de-sulphurization of atmospheric residue.

During the period 2004-06 the Institute developed three novel technologies for producing bio-diesel through trans-esterification of non-edible vegetable oils such as Jatropha Curcas, Pongamia, Salvadora, Madhuca Indica and others. The products met the ASTM/European/BIS specifications.

Several technologies were also commercialised by IIP during this phase. IIP-Bharat Petroleum LPG Sweetening catalyst under-went a successful trail at Bharat Petroleum Refinery in Mumbai and Reliance Industries tested the catalyst in their unit at Jamnagar.

This period also marked the creation of Institute's logo and slogan "Creating Future Fuels".

During November 2007 Mr V Subramanian, Chairman, Research Council, IIP dedicated the Biomass Fast Pyrolysis Unit to the Institute. This unit is tailor-made to study the pyrolysis of

Director, IIP along with eminent scientists at the conference on Catalysis for Future Fuels organised jointly by Catalysis Society of Indai and IIP at Dehradun.

Dr. M.O. Garg, Director IIP addressing the scientists at the conference on Catalysis for Future Fuels organised at IIP, Dehradun in April 2007.

Rancimat Unit. The unit is used to study the effectiveness of the synthetic anti-oxidant for enhancement of oxidation stability of bio-diesel.

Automatic Micro Distillation Analyser. It is a highest quality design unit which provides a complete distillation run and test report in 12 minutes using only 10 ml of sample with the excellent repeatability and reproducibilty.

Automatic Pensky Martins Flash Point Tester. It is a system for automatically lighting the test flame and positioning the stirring mechanism, strong 20 test methods, 500 test results and provides the statistics resports.

biomass for the products of liquefied bio-oils and its further processing to yield transportation fuel and valuable chemicals.

The unit was designed by IIP for the process and procured and commissioned for the studies.

This period also saw a lab/bench scale delayed coking unit was set-up with a feed capacity of about 4 lit/hr for undertaking delayed coking studies on vacuum residues to produce anode/ needle coke. The unit was successfully commissioned.

State-of-art facilities for development of catalysts and processes for gas-to-liquid fuels were created in the Institute for the first time. This included Syngas generator, microprocessor based high pressure fixed bed reactor unit for Fischer-Tropsch fuels and DME sysnthesis with on-line GC analyzer and gas distribution system with gas leak detectors. These facilities are being utilized for various catalytic reaction studies with gaseous hydrocarbon feedstocks with a view to evaluate key process parameters and conditions associated with catalyst activity/selectivity, catalyst development and regeneration.

To provide a comprehensive review of available commercial and emerging technologies for conversion of carbonaceous feedstocks to value added products, including electric power, steam, hydrogen, transportation fuels and other chemicals by means of gasification RTI International, US and IIP jointly organised a meet. The benefits of gas based energy conversion systems is that it is stable, affordable, high- efficiency energy supply with a minimal environment impact. It is also the most economical technology for CO2 capture.

In order to keep pace with the world scenario, India formulated a plan for sulfur specifications for diesel from 2005 onwards to meet the specifications of sulphur in diesel required under Bharat Stage (BS) IV.

The Institute initiated work to develop indigenous catalyst for ultra-deep desulphurization of gas-oil to produce diesel having sulphur content of 50 ppm or lower. The financial assistance for this project was provided by the Centre for High Technology (CHT), New Delhi.

A catalyst, namely, UD-25 of CoNiMo/Alumina-zeolite type was developed which could reduce sulphur content of refractory straight-run gas oil from initial ~2000 ppm to 50 ppm.

A novel methodology has been developed for the hydroxylation of benzene to phenol, toluene to cresols and anisole to methoxy phenols by using hydrogen peroxide as environmental benign oxidant, vanadyl tetraphenoxyphthalocyanine as a heterogeneous recyclable catalyst and acetonitrile as solvent under mild conditions. The protocol yields significantly high 41.5% conversion of benzene to phenol with 100% selectivity for phenol.

IIP had also embarked on creation of major ultra modern emission measurement facilities with financial support from OIDB and CSIR. Collaborative R&D programmes were undertaken with various organisations from Norway, U.K., Saudi Arabia, USA etc, generating handsome financial retuns. IIP earnings, from its R&D activities, peaked to a record Rs. 16.22 crores during this decade.

The Institute has even executed several projects abroad, particularly in Saudi Arabia and the United Kingdom.

In the year 2007 a collaborative research work was initiated with SBSPGI for Bioprospecting of novel antimicrobials and industrially important enzymes from microbial isolates in Uttarakhand Himalaya. The project (GAP – 3504) was funded by state DST (UCOST, Dehradun).

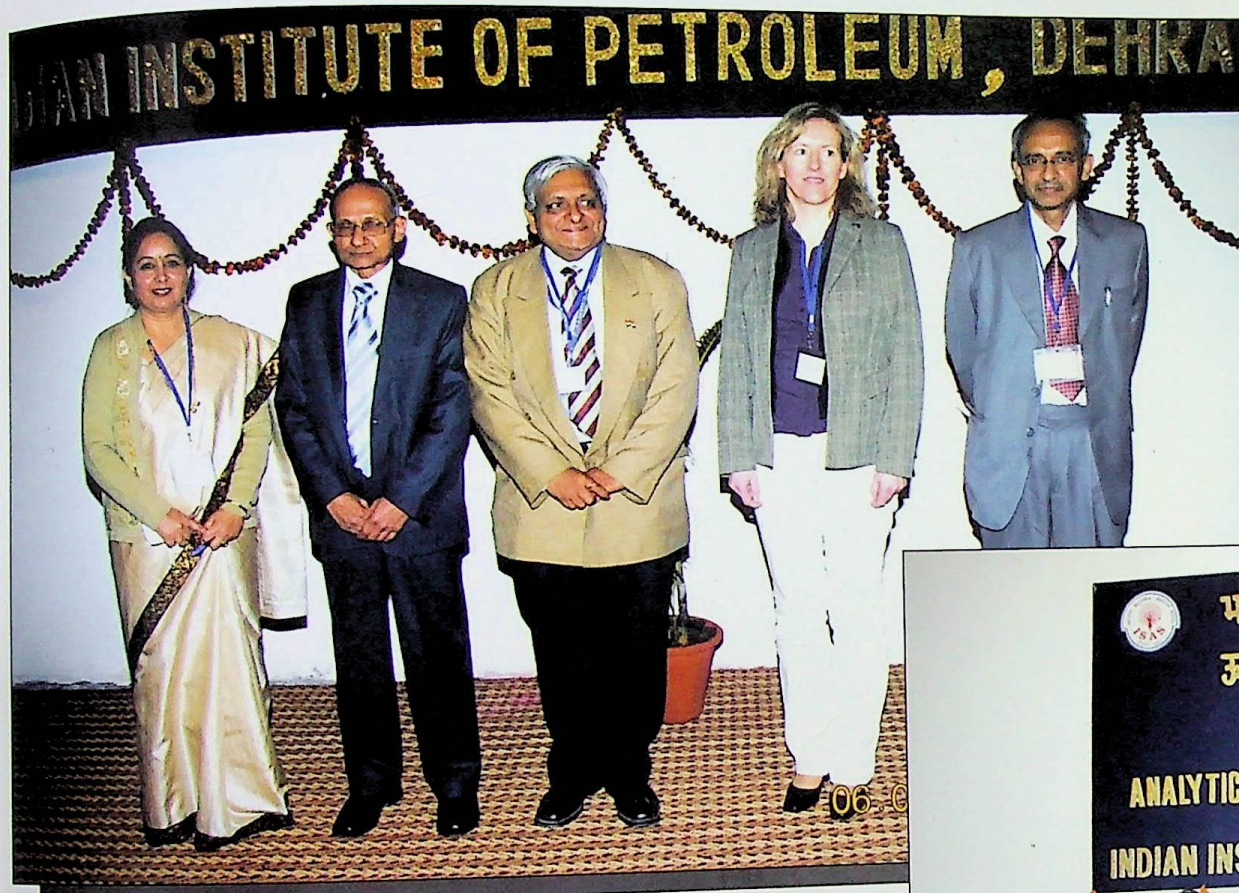
IIP undertook a project under the CSIR welfare activity for rural masses. The project was undertaken with aim of following

The map shows IIP's International Footprints during 2009-10

The then Secretary Petroleum Mr. R.S. Pandey inaugurating the Gas-to-liquid Laboratory. On September 26, 2008. Mr. Anand Kumar, Director (R&D), Indian Oil and Dr. M.O. Garg and IIP scientists are also seen.

Mr. Anand Kumar, Director R&D, Indian Oil inaugurating the Mass Emission Testing Facitilies in the presence of the then Secretary Petroleum Mr. R.S. Pandey and Director IIP Dr. M.O. Garg on September 26, 2008.

Inauguration of the new Gas Adsorption Laboratory by Dr. S. Chandra. Witnesses to the occasion (L-R) : Dr. M.O. Garg, Dr. Asha Masohan and Dr. A. Datta.

Mr L Mansingh (middle) Chairman, Petroleum and Natural Gas Regulatory Board lighting the lamp on CSIR Foundation Day.

IIPand SINTEF, Norway experts at the second Indo-Norwegian Seminar on "Advances in Seperation Technologies" at IIP during January 2010.

Group photograph of IIP and ISAS Delhi Chapter Scientists with the Chief Guest, Director and Senior Scientists of IIP during November 2009.

IIP, Ministry of Petroleum and Natural Gas and Industry experts discuss options for better future mobility at the Indo-German Seminar on Future Mobility organised jointly by IIP and German Academic Exchange Services-DAAD during Feburary 2010.

Director IIP and other experts from process industry at the symposium on Solvent Extraction during February 2010.

IIP scientists recieving the CSIR Technology Award 2009 from the Minister of State, Science & Technology and Earth Sciences.

The CSIR Technology Award 2009 plaque

President of India Smt. Pratibha Devi Patil awards IIP

President of India Smt. Pratibha Devi Patil awarded IIP for its contribution to Hindi through the Institutes Hindia Mazgine "Vikal". Dr. M.O. Garg, Director IIP recieving the award from the President of India on behalf of the Institute.

Prof. M. M. Sharma an eminent scientist along with Dr. M.O. Garg

improvements in the conventional *gur bhatti.*
(i) Reduction in fuel (bagasse) consumption.(ii) Reduction in chimney smoke.(iii) Increase in the furnace life.

The Institute inaugurated the state-of-the-art GTL laboratory and Engine Emissions laboratory during 2008 at the hands of the then Secretary, Ministry of Petroleum & Natural Gas and Director (R&D), Indian Oil Corporation.

The Institute also saw the inauguration of the new Gas Adsorption Laboratory by Joint Advisor (Fertilizer), Department of Chemical & Fertilizers, New Delhi.

The Golden Jubilee year (2009-10) of IIP started on a very positive note. Maintaining its legacy the Institute once again bagged the 2009 CSIR Technology Award in the category of 'Physical Sciences include Engineering' on innovation technology for upgrading fuel oil components into premium refinery products.

Besides technology, in 2009 the institute also bagged two national awards; the first at the hands of the President of India Smt. Pratibha Devi Patil and the second from the Minister for Science and Technology, Government of India for the institutes Hindi magazine *"Vikalp"*. The award was instituted by the Department of Official Language, Ministry of Home Affairs, Government of India.

Director General, CSIR visits IIP

Visit of Prof Samir K Brahmachari, Director General, CSIR. on December 26,2009.

Prof. Samir K. Brahmachari being welcomed by Director IIP at the Institute.

Director General, CSIR at the Hydrodesulphurization Laboratory

Governor Uttarakhand visits IIP

Visit of Mrs. Margaret Alva, Governor of Uttarakhand to IIP on January 20, 2010. Dr. M.O. Garg, Director IIP also seen in the photo.

Mrs. Margaret Alva, Governor of Uttarakhand along with Director and senior scientists of IIP during the Oil Conservation Fortnight function organised at IIP on Janurary 20, 2008.

The Institute's Golden Jubilee Year Celebrations was flagged off by eminent scientist Prof.M.M.Sharma in April 2009. The Golden Jubilee logo was also unveiled on the occasion. Prof Sharma also laid the foundation stone of the proposed 'Golden Jubilee Building' which will accommodate the state-of-the-art Crude Evaluation Laboratory.

As part of the Golden Jubilee year celebrations besides various programmes, the Institute has organised seminars of various important topics like 'Fossil Economy to Biomass Economy: Opportunities and Challenges', 'Solvent Extraction Revisited: Applications in Process Industries', 'Analytical Sciences in Energy and Environment', 'Indo-German Seminar on Future Mobility' and 'Advances in Seperation Technologies' an Indo-Norwegian joint seminar.

The Mandate

The initial mandate of the Institute was to undertake R&D work in petroleum refining, natural gas and petro-chemicals and utilisation of petroleum products, train personnel for oil industry, assist the Bureau of Indian Standards in formulation of standards for petroleum products, Conduct market demand surveys and techno-economic feasibility studies of petroleum and also to assist the industry in adsorption, adoption and selection of technologies.

Today the institute boasts of being an ISO 9001-2000 accredited organisation engaged in research and development activities mostly in the downstream sector of petroleum industry. Its charter is to undertake R&D work in petroleum refining, natural gas, petrochemicals and petroleum products utilisation, provide high science based technological services to refining and related industry. It also conducts market demand surveys and TEFS for petroleum products besides training personnels for regulatory bodies, hydrocarbon, automotive and related industry. The institute even assists in formulation of natiional standards for petroleum products.

Summary

Looking back, it can be said that the Institute was the result of the thoughts and actions of the forward looking planners, who saw the need to make India self reliant in the realm of hydrocarbon technology. It was thus set up to give technical and scientific support to the entire of public sector in the field of hydrocarbon processing and application.

The heights Institute gained during this era could not have been possible without the tireless efforts by some eminent scientists like Dr. J.S.Ahluwalia, Deputy Director, Dr.K.K. Bhattacharya, Deputy Director and Head of Petrochemistry Division. Shri. M.Kurien the then Head Project Division, Shri.P.K.Goel the then Head, Applications Division, Shri.K.P.Rao, Head, General Technical and Services Division, Dr.R.K.Srivastava, Head Coordination and Information Division, Shri.G. Balamalliah. The Training Division which was always a center of activities at the institute since its inception was very successfully led since 1964 by Dr.Himmat Singh till his superannuation in early 2000.

The other first generation scientists of the Institute, besides the many, who worked under different tenures whose contribution cannot go un-mentioned, were Shri.H. K. Mulchandani, Head, General Technical Services, Dr.P.L.Gupta, Head, Refining Division, Shri.R.A.Rao, Head, Engines Laboratory, Shri.D.L.Kapoor, Head Engineering Services Division, Shri.P.N.Bhambi, Head, Application

IIP Technologies Licensed
Panipat Refinery
Soaker Visbreaking
New Delhi
LAP Burner Wick Stove
Barauni
Delayed Coking
Visbreaking LOBS
NMP Extrn
Faridabad
LAP Burner
Mathura Refinery
Visbreaking (Revamp)
Numaligarh
Delayed Coking
Bongaigaon
Delayed Coking
Indore
Wick Stove
Baroda
Visbreaking (Revamp)
Bi-metallic Reformer Cat
NTGG
Retrofit-kit
Durgapur
Ethanol Dehyd. Cat.
Ahmedabad
Sulpholane
Calcutta
LAP Burner
Rajkot
Wick Stove
Haldia
Visbreaking (Revamp)
Dewaxing / Deoiling (Revamps)
LOBS NMP Extrn
Mumbai
Bio-diesel
BT Extraction
FGH Production
Dewaxing Aid Additive
Hot Rolling Oil
PTBP / BHT
LAP Burner
Vishakhapatnam
Soaker Visbreaking
Hyderabad
EP Additive
Sulphonates
Bangalore
Impregnating Pitch
Chennai
Food Grade Hexane
Bi-metallic Reformer Cat
PTBP / BHT
Visbreaking (Revamp)
PDA
Coimbatore
LAP Burner
LPG Stove
Kochi
BT Extraction
Visbreaking (Revamp)

Division and Dr.V.R.Sista, Head Proteins from Petroleum. The contribution of Shri.A.V.Venkatesh in the field of Combustion Sciences, Dr.P. Desikan in Fuel Additives and Dr.R.K.Niyogi in Hydrogenation of Kerosene.

Among some of the second generation scientists whose contribution was equally strong as the first generation scientists were: Shri.Sudhir Singhal, Head, Petroleum Products Application Division. Shri Singhal subsequently rose to be the Director of IIP. The other second generation scientists were Dr. G.C.Joshi, Head, Synthesis and Structural Chemistry Division, Shri. V.N.Badami, Head, Project Monitoring Cell, Dr.B.S.Rawat, Head, Seperation Processes Division, Dr.B.P.Pundir, Dr.R.P.Mehrotra, Dr.S.D.Bhagat. Shri. K.K.Gandhi, Dr.A.K.Gupta, Dr.Pradeep Kumar, Dr. I.D.Singh, Dr.S.N.Sharma, Shri. P.V.Dogra, Shri. Mohan Lal, Head, Conversion Processes Division, Shri. S.C.Vishnoi, Head, Crude & Products Evaluation Division, Dr.V.K.Bhatia, Organic Chemistry Division, Dr.K.S.Jauhari, Head, Industrial Liaison, Shri.V.S.Saini, Shri.G.N.Kulsrestha, Dr.G.Murli Dhar, Dr.Uma Shankar Dr. V.K. Bhatia, Shri V.K. Kapoor and Shri G.S. Dang. The list is endless.

IIP over the years is adjudged as one of the star performers of CSIR as it has been able to licence its technologies developed to key companies around the world.

A constituent laboratory of CSIR, IIP has a Research Council which is responsible for formulation of short and long term research programmes as well as possible monitoring of their progress. It is constituted by the Director General, CSIR and has eminent experts from the field of petroleum technology from the industry as well as prestigious academic institutions besides the Director of the institute.

The Management Council of IIP is the approving authority for major administrative functions of the institute. It is headed by the Director and has several members from the institute as well as other CSIR laboratories.

IIP has provided leadership in developing high science, based on which technologies have been developed, taking environment into consideration.

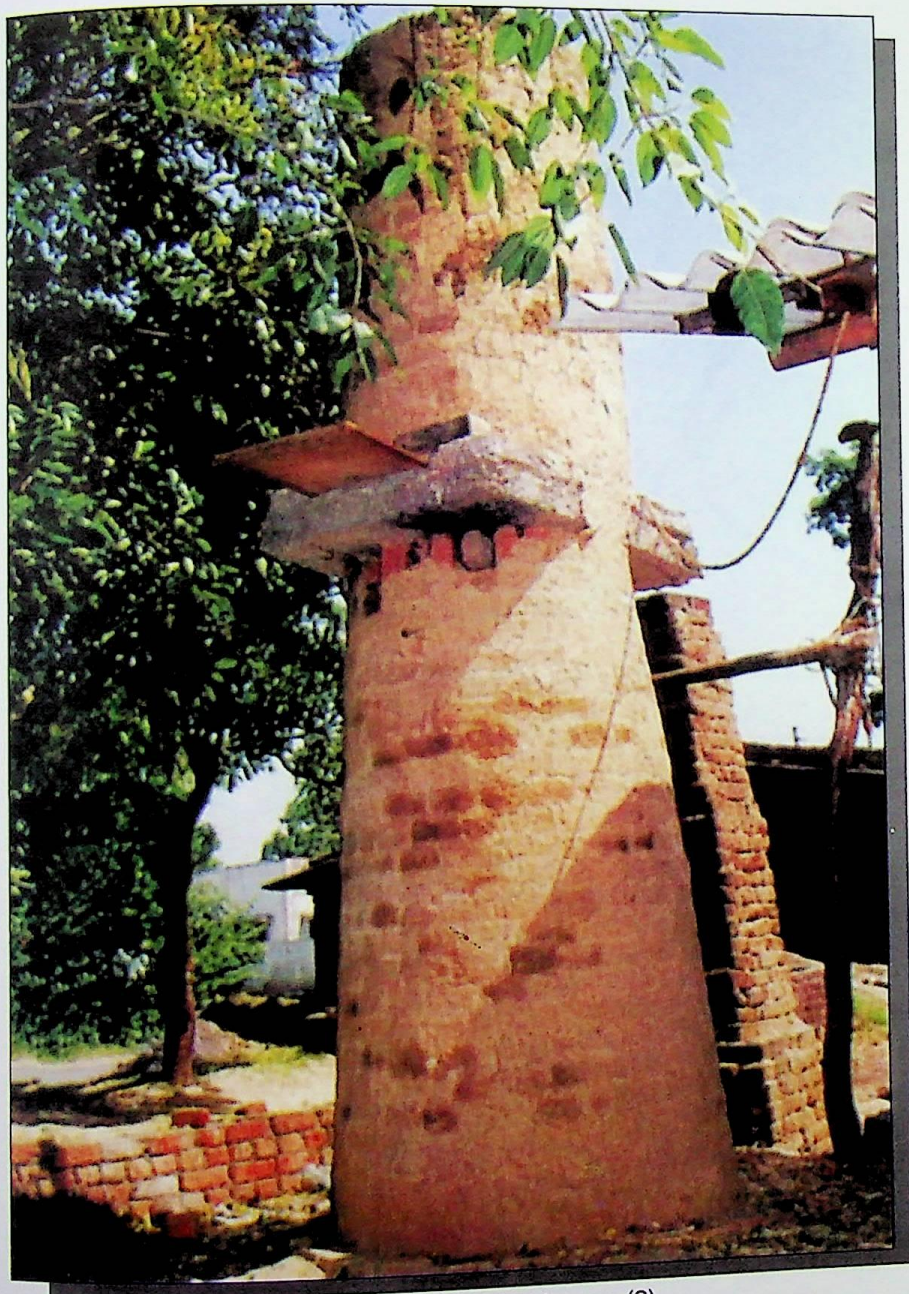
Today IIP scientists also play lead roles as Chairman/ Member of various government committees and sub-committees that formulate and make recommendations on numerous petroleum fuel related aspects.

On Road to Success

During the past five decades IIP has developed around 70 technologies/ processes/ products, a large number of them were commercialised against global competition. Today every refinery in the country has either a technology, product, know how or services licensed by the Institute.

Corporate Social Responsibility

Long before the concept of "Corporate Social Responsibility" (CSR) became a fashionable buzzword, IIP has been working in the neighbouring villages. IIP has modified *Gur Bhatties* (an indigenous oven for making *jaggery*) in near by villages, and has also convinced Petroleum Conservation Research Association (PCRA) to popularize IIP designed *Gur Bhattis*". As a result, PCRA now provides subsidy to such Gur *Bhatti* owners who switched over to the new technology.

Another CSR initiative has been the campaign to popularize

Improved gur bhatti : Chimney (2)

Improved gur bhatti : Furnace

Mr. A.K. Goel, along with Dr. M.O. Garg, presenting a cheque of Rs 20,000 to Mr. Prakash Chand of Biharigarh who adopted the technology recently

the subjects of science, particularly among school students. In this context, the institute invites batches of school students and explains to them in easy-to-understand manner the various subjects. It also conducts science workshops in schools.

The Institute has always come forward to help the needy during any natural calamity faced by the country. Its active role during the Uttarkashi earthquake few years back is laudable.

Source of Information

- Former employees and scientists of IIP.
- IIP Annual Reports since 1960 to date.
- IIP printed literature since 1960 to date.
- Printed literature of PSU oil companies.